Vol. 941 Number 3

AMOCO OIL CO.
DEC 19 1975
RESEARCH LIBRARY

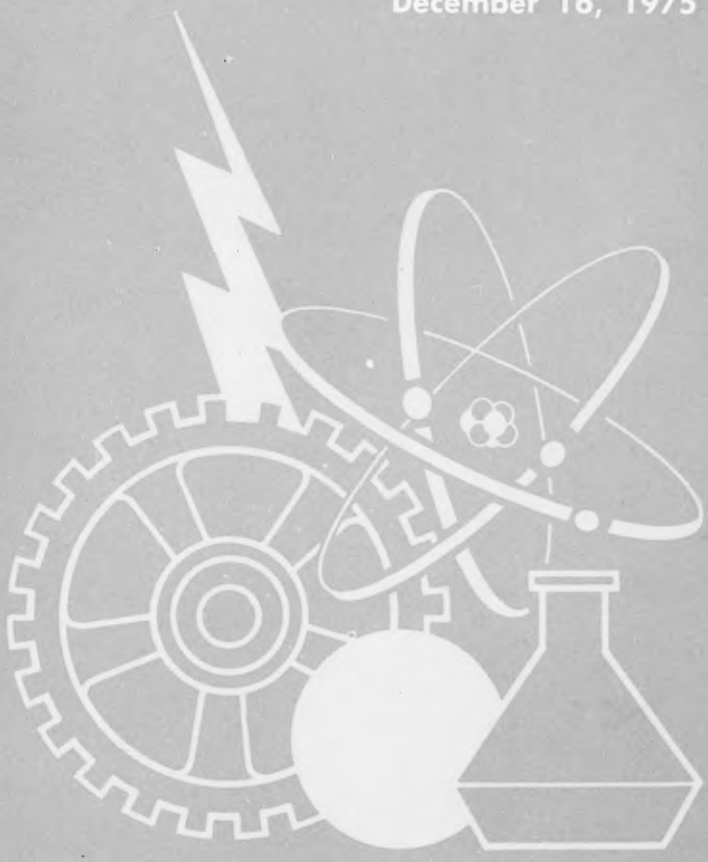
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

December 16, 1975



U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

DEC 19 1975
RESEARCH LIBRARY

OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

December 16, 1975 Volume 941 Number 3

CONTENTS

	Page
Patent and Trademark Notices	
Second Trial Voluntary Protest Program	1010
Patent Suits	1010
Patent Notices	
Certificates of Correction for the Week of December 16, 1975	1012
Disclaimers	1012
Dedications	1012
Condition of Patent Applications	1013
Reissue Patents Granted (28,649)	1014
Plant Patents Granted (3,815)	1017
Patents Granted	
General and Mechanical (3,925,821)	1019
Chemical (3,926,546)	1263
Electrical (3,927,246)	1442
Design Patents Granted (238,016)	1504
Index of Patentees	PI 1
Cross Reference of Published Patent Applications Published Under Trial Voluntary Protest Program	PI 52
Indices of Applicants of Reissues, Plants and Designs	PI 56
Classification of	
Patents (Including Reissues)	PI 59
Designs and Plants	PI 62
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 63
Designs and Plants	PI 65

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $342.20 per annum, foreign mailing $85.55 additional; single copies $6.60 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $88.40 per annum, foreign mailing $22.10 additional; single copies $1.70 each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS, price 60 cents each.

CIRCULARS OF GENERAL INFORMATION concerning TRADEMARKS, price 50 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

UNITED STATES PATENT and TRADEMARK OFFICE

Second Trial Voluntary Protest Program

Publication of Applications

Applications will be published under the Second Trial Voluntary Protest Program on the following dates:

January 13, 1976
January 20, 1976
January 27, 1976
February 3, 1976

Additional publication dates will be announced as they become known.

RICHARD J. SHAKMAN,
Dec. 1, 1975. *Assistant Commissioner for Administration.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,826,760, E. G. Rice, COMBINATION STOCKINGS AND PANTY; **Re. 25,360,** same, **filed** June 25, 1975, D.C., W.D.N.C. (Statesville), Doc. ST–C–75–27, *Tights, Inc.* v. *Maro Hosiery Corporation, doing business as Temptation Hosiery Mills.* **Same, filed** June 25, 1975, D.C., W.D.N.C. (Statesville), Doc. ST–C–75–28, *Tights, Inc.* v. *Troydon Hosiery Mill, Inc.* **Same, filed** July 1, 1975, D.C.S.C. (Columbia), Doc. C/A 75–1124, *Tights, Inc.* v. *C. W. Anderson Corp.* **Same, filed** July 3, 1975, D.C., W.D.N.C. (Statesville), Doc. ST–C–75–29, *Tights, Inc.* v. *J. P. Stevens & Co., Inc.*

2,989,302, H. B. Clark, FIRE DOOR OPERATING APPARATUS; **3,166,155,** same, MOTOR OPERATED FIRE DOORS WITH AUTOMATIC DOOR RELEASE, **filed** Jan. 30, 1973, D.C.N.J. (Newark), Doc. C–119–73, *Mesker Brothers Industries, Inc. et al.* v. *Henry B. Clark.* Stipulation and order of dismissal of action, May 1, 1975.

3,011,198, T. V. Moss, MOP SWAB, **filed** Aug. 15, 1975, D.C., N.D. Ga. (Atlanta), Doc. C75–1612A, *Theron V. Moss and South Eastern Cordage Company* v. *Wilen Manufacturing Company.*

3,103,618, S. I. Slater, CONTINUOUSLY VARIABLE DIMMER SWITCH; **3,222,488,** B. H. Matthews, ELECTRICAL SWITCH WITH CAMMING BRIDGING CONTACT; **3,328,676,** S. I. Slater, CONTINUOUSLY VARIABLE DIMMER SWITCH, **filed** Apr. 29, 1966, D.C., N.D. Ohio (Cleveland), Doc. C66–315, *Lucerne Products, Inc. and Slater Electric, Inc.* v. *Cutler-Hammer, Inc. (substituted for Sears, Roebuck and Company by stipulation on 12–6–66),* Judgment is hereby entered finding that the defendant has infringed a valid patent held by plaintiff, Mar. 7, 1975.

3,166,155. (See 2,989,302.)

3,185,364, R. A. Kleist, DRIVE SYSTEM FOR TAPE TRANSPORT SYSTEM; **3,251,563,** same, MAGNETIC TAPE TRANSPORT SYSTEM; **3,276,651,** P. S. Bryer, ROLLER GUIDE FOR WEB TRANSPORT MECHANISMS; **3,318,545,** R. Tobey, WEB TRANSPORT SYSTEM; **3,379,948,** Lewis, Wang and Kleist, TAPE TRANSPORT DRIVE SYSTEM; **3,383,578,** M. A. Lewis, CONTINUOUS MODE MOTOR SPEED CONTROL SYSTEM, **filed** May 27, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–1711–R, *Ampex Corporation* v. *Wangco Incorporated.*

3,186,491, L. J. Fischer, HELICOPTER DRIVE SYSTEM UTILIZING TIP MOUNTED FANS; **Re. 26,518,** Mau and Nagy, THREAD AND OTHER FORM ROLLING DIES, **filed** Sept. 12, 1972, D.C., N.D. Ohio (Cleveland), Doc. C–72–960, *The National Rolled Thread Die Co.* v. *The Lamson & Sessions Co.* Judgment on decision by the Court, finding that patent in suit valid, but not infringed, judgment entered in favor of defendant, as to the claim of infringement, further ordered that Court's memorandum opinion is adopted as findings of fact and conclusions of law, Apr. 30, 1975. **Same, filed** Sept. 12, 1972, D.C., N.D. Ohio (Cleveland), Doc. C72–961, *The National Rolled Thread Die Co.* v. *Sterling Die Division of Pratt & Whitney, Inc. and Colt Industries Operating Corp.* Judgment on decision by the Court, finding that patent in suit valid, but not infringed, judgment entered in favor of the defendant, as to the claim of infringement, further ordered that Court's memorandum opinion is adopted as finding of fact and conclusions of law, Apr. 30, 1975.

3,197,710, H. C. Lin, COMPLEMENTARY TRANSISTOR STRUCTURE; **3,237,062,** B. T. Murphy, MONOLITHIC SEMICONDUCTOR DEVICES; **3,321,340,** same, METHODS FOR FORMING MONOLITHIC SEMICONDUCTOR DEVICES; **3,412,460,** H. C. Lin, METHOD OF MAKING COMPLEMENTARY TRANSISTOR STRUCTURE, **filed** July 8, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c2230, *Westinghouse Electric Corporation* v. *Motorola, Inc. et al.*

3,205,532, R. D. MacDonald, LATCHLESS DOOR HINGE; **3,212,124,** same, HINGE FOR LATCHLESS DOOR, **filed** Apr. 16, 1975, United States Court of Appeals, Ohio (Cincinnati), Doc. 74–113 and 1134, *Cardinal of Adrian, Inc.* v. *Peerless Wood Products, Inc. et al.* The judgment of the District Court as to both patents is affirmed, Apr. 16, 1975.

3,212,124. (See 3,205,532.)

3,215,976, W. N. Bascom, METHOD FOR SURVEYING AND SEARCHING THE OCEAN BOTTOM AND RECOVERING OBJECTS THEREFROM; **3,472,191,** E. E. Horton, HYDROPNEUMATIC SALVAGE SYSTEM, **filed** July 16, 1975, United States Court of Claims (District of Columbia), Doc. 239–75, *Ocean Science & Engineering, Inc. and Willard N. Bascom* v. *The United States.*

3,222,488. (See 3,103,618.)

3,237,062. (See 3,197,710.)

3,251,563. (See 3,185,364.)

3,276,651. (See 3,185,364.)

3,318,545. (See 3,185,364.)

3,321,240. (See 3,197,710.)

3,379,948. (See 3,185,364.)

3,383,578. (See 3,185,364.)

3,472,191. (See 3,215,976.)

Re. 25,360. (See 2,826,760.)

Re. 25,360, E.G. Rice COMBINATION STOCKINGS AND PANTY, **filed** June 25, 1975, D.C., W.D.N.C. (Charlotte), Doc. C–C–75–203, *Tights, Inc.* v. *Hampshire Designers, Inc.* **Same, filed** June 25, 1975, D.C., W.D.N.C. (Charlotte), Doc. C–C–75–204, *Tights, Inc.* v. *Knit Products Corporation.* **Same, filed** June 25, 1975, D.C., W.D.N.C. (Charlotte), Doc. C–C–75–205, *Tights, Inc.* v. *Outlook Manufacturing Company.* **Same, filed** June 25, 1975, D.C., W.D.N.C. (Charlotte), Doc. C–C–75–206, *Tights, Inc.* v. *Admiration Hosiery Mill, Inc.* **Same, filed** July 9, 1975, D.C., W.D.N.C. (Charlotte), Doc. C–C–75–218, *Tights, Inc.* v. *Vision Hosiery Mills, Inc.* **same, filed** June 20, 1975, D.C., M.D.N.C. (Greensboro), Doc. C–75–225–G, *Tights, Inc.* v. *Aladdin Knit Mills, Inc. (Division of Kellwood Co.).* **same, filed** June 20, 1975, D.C., M.D.N.C. (Winston-Salem), Doc. C–75–226–WS, *Tights, Inc.* v. *Amos & Smith Hosiery Company.* **Same, filed** June 20, 1975, D.C., M.D.N.C. (Greensboro), Doc. C–75–227–G, *Tights, Inc.* v. *Ann-Carol Hosiery Mills, Inc.* **Same, filed** June 20, 1975, D.C., M.D.N.C. (Greensboro), Doc. C–75–228–G, *Tights, Inc.* v. *Bossong Hosiery Mills, Inc.* **Same, filed** June 20, 1975, D.C., M.D.N.C. (Greensboro), Doc. C–75–229–G, *Tights, Inc.* v. *Commonwealth Hosiery Mills, Inc.* **Same, filed** June 20, 1975, D.C. M.D.N.C. (Greensboro), Doc. C–75–230–G, *Tights, Inc.* v. *Glen Raven Mills, Inc.* **Same, filed** June 20, 1975, D.C., M.D.N.C. (Greensboro), Doc. C–75–231–G, *Tights, Inc.* v. *Laughlin Hosiery Mills, Inc.* **Same, filed** June 20, 1975, D.C., M.D.N.C. (Greensboro), Doc. C–75–232–G, *Tights, Inc.* v. *Silver-Knit Industries, Inc.* **Same, filed** June 20, 1975, D.C., M.D.N.C. (Greensboro), Doc. C–75–233–G, *Tights, Inc.* v. *Slane Hosiery Mills, Inc.* **Same, filed** June 20, 1975, D.C., M.D.N.C. (Salisbury), Doc. C–75–234–S, *Tights, Inc.* v. *Stanley Knitting Mills, Inc.* **Same, filed** June 20, 1975, D.C., M.D.N.C. (Greensboro), Doc. C–75–235–G, *Tights, Inc.* v. *Troxler Hosiery Company, Inc.* **Same, filed** June 20,, 1975, D.C., M.D.N.C. (Salisbury), Doc. C–75–236–S, *Tights, Inc.* v. *U.S. Industries.* **Same, filed** June 23, 1975, D.C., M.D.N.C. (Wilkesboro), Doc. C–75–244–W, *Tights, Inc.* v. *Ithaca Ho-*

siery, Inc. **Same, filed** June 25, 1975, D.C., M.D.N.C. (Greensboro), Doc. C–75–251–S, *Tights, Inc.* v. *Caburrus Hosiery Company.* **Same, filed** June 25, 1975, D.C., M.D.N.C. (Greensboro), Doc. C–75–252–S, *Tights, Inc.* v. *Hillview Industries, Inc.* **Same, filed** June 25, 1975, D.C., M.D.N.C. (Greensboro), Doc. C–75–253–S, *Tights, Inc.* v. *Scenic Hosiery, Inc.* **Same, filed** June 25, 1975, D.C., M.D.N.C. (Greensboro), Doc. C–75–254–S, *Tights, Inc.* v. *Trend Hosiery Company, Inc.* **Same, filed** June 25, 1975, D.C., M.D.N.C. (Greensboro), Doc. C–75–255–G, *Tights, Inc.* v. *Nantucket Hosiery Mills Corp. (Division of Nantucket Industries, Inc.).* **Same, filed** June 26, 1975, D.C., M.D.N.C. (Greensboro), Doc. C–75–260–G, *Tights, Inc.* v. *Best Wear Hosiery Mills, Inc.*

Re. 26,518. (See 3,186,491.)

D. 180,053, J. Zalewski, COLLAPSIBLE DISPLAY ORNAMENT OR SIMILAR ARTICLE, **filed** Aug. 21, 1963, D.C., S.D.N.Y., Doc. 63–C–2519, *Austen Display Inc.* v. *Lerner, Corwin & Young Inc. et ano.* Filed order dismissing action for lack of prosecution without prejudice, Dec. 7, 1964.

D. 198,760, L. T. Harris, RIVETLESS CHAIN LINK, **filed** Jan. 20, 1975, D.C., S.D., W. Va. (Charleston), Doc. 75–0010BK, *Portec, Inc.* v. *Janes Manufacturing, Inc. and Cooke-Wilson Electric Supply Company.*

D. 206,447, R. V. Switzer, COMBINED WHEEL CHOCK AND FLAG, **filed** Jan. 3, 1975, D.C., S.D. Fla. (Miami), Doc. 75–9–NCR, *The Aldon Company* v. *Equipment Company of America.*

D. 208,971, L. G. Stone, PULL, **filed** May 6, 1975, D.C., S.D. Ind. (Evansville), Doc. EV–75–59–C, *Amerock Corporation* v. *Bliss & Laughlin Industries, Incorporated.*

Erratum

Under Patent Suits in the OFFICIAL GAZETTE of November 4, 1975, volume 940, page 2, the entire paragraph beginning with "3,485,587" should be deleted.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 16, 1975

D. 236,141	3,860,650	3,895,864	3,904,009
3,744,861	3,861,956	3,896,934	3,904,069
3,746,850	3,863,710	3,897,137	3,904,312
3,763,228	3,866,849	3,897,242	3,904,326
3,768,482	3,867,130	3,897,488	3,904,455
3,772,353	3,867,626	3,897,513	3,904,545
3,777,465	3,870,426	3,898,188	3,904,701
3,778,408	3,870,585	3,898,225	3,904,730
3,781,170	3,873,409	3,898,287	3,904,933
3,785,956	3,874,803	3,898,330	3,905,239
3,789,195	3,874,845	3,898,940	3,905,923
3,790,964	3,875,097	3,898,974	3,906,136
3,791,847	3,875,283	3,899,388	3,906,211
3,792,768	3,877,021	3,899,443	3,906,566
3,792,971	3,878,328	3,899,772	3,906,598
3,805,849	3,879,173	3,899,949	3,906,685
3,809,159	3,880,296	3,900,282	3,906,768
3,813,424	3,880,402	3,900,319	3,907,127
3,813,591	3,881,173	3,900,362	3,907,128
3,816,421	3,882,442	3,900,438	3,907,167
3,817,840	3,882,668	3,900,824	3,907,178
3,818,096	3,883,368	3,900,851	3,907,201
3,819,842	3,883,997	3,900,918	3,907,282
3,821,068	3,884,700	3,900,920	3,907,382
3,821,376	3,885,005	3,901,247	3,907,470
3,831,882	3,886,004	3,901,357	3,907,528
3,840,653	3,886,210	3,901,418	3,907,546
3,841,494	3,886,260	3,901,660	3,907,620
3,843,660	3,887,311	3,901,757	3,907,655
3,843,839	3,888,715	3,901,907	3,907,847
3,844,733	3,888,812	3,901,998	3,908,118
3,844,861	3,890,200	3,902,151	3,908,264
3,845,009	3,891,565	3,902,153	3,908,271
3,846,173	3,891,658	3,902,666	3,908,397
3,850,642	3,891,898	3,902,859	3,908,570
3,852,313	3,892,759	3,902,964	3,908,671
3,854,126	3,892,785	3,903,053	3,908,727
3,854,784	3,893,757	3,903,195	3,909,084
3,855,111	3,893,842	3,903,198	3,909,131
3,856,006	3,894,150	3,903,243	3,909,213
3,857,052	3,894,248	3,903,251	3,909,542
3,857,759	3,895,544	3,903,375	3,910,496
3,858,901	3,895,635	3,903,527	3,911,080
3,860,102	3,895,723	3,903,575	

Disclaimers

3,770,315.—*Darrell G. Smittle,* Malibu, and *Asbjorn Karlsen,* Pacific Palisades, Calif. SELECTIVELY ADJUSTABLE LUMBAR SUPPORT FOR AIRCRAFT SEATS AND THE LIKE. Patent dated Nov. 6, 1973. Disclaimer filed Sept. 25, 1975, by the assignee, *UOP Inc.*

Hereby enters this disclaimer to claims 5 and 6 of said patent.

3,810,697.—*Samuel B. Steinberg,* Baltimore, Md. PORTABLE FILTER EVALUATION APPARATUS. Patent dated May 14, 1974. Disclaimer filed Nov. 19, 1974, by the assignee, *Air Techniques, Inc.*

Hereby enters this disclaimer to claims 1–10 of said patent.

3,825,583.—*Anwar A. Hussain* and *James E. Truelove,* Lawrence, Kans. ESTER OF 3-HYDROXY-α-[(METHYLAMINO)METHYL]BENZYL ALCOHOL. Patent dated July 23, 1974. Disclaimer filed Oct. 8, 1975, by the assignee, *Interx Research Corporation.*

The term of this patent subsequent to May 7, 1991, has been disclaimed.

3,850,414.—*Hans R. Scharer,* Wallingford, Conn. HOMOGENIZING EXTRUDERS. Patent dated Nov. 26, 1974. Disclaimer filed Sept. 15, 1975, by the assignee, *USM Corporation.*

Hereby enters this disclaimer to claims 1–8 of said patent.

3,904,979.—*Tadao Suzuki,* Tokyo, Japan. PROTECTIVE CIRCUIT FOR TRANSISTOR AMPLIFIER. Patent dated Sept. 9, 1975. Disclaimer filed Oct. 20, 1975, by the assignee, *Sony Corporation.*

Hereby enters this disclaimer to claims 1, 2, 5 and 9 of said patent.

3,905,098.—*Oliver R. Garretson* and *Richard C. Harmon,* Mountain View, Calif. MICROELECTRONIC TEST PROBE CARD INCLUDING A MULTIPLICITY OF PROBE CONTACTS AND METHOD OF MAKING SAME. Patent dated Sept. 16, 1975. Disclaimer filed Sept. 23, 1975, by the assignee, *Xynetics, Inc.*

The term of this patent subsequent to Sept. 10, 1991, has been disclaimed.

3,912,281.—*Stephen A. Platt,* Grand Haven, Mich. SOUND REPRODUCTION APPARATUS. Patent dated Oct. 14, 1975. Disclaimer filed Oct. 6, 1975, by the assignees, *Stephen A. Platt* and *Vernet B. Platt.*

The term of this patent subsequent to Feb. 11, 1992, has been disclaimed.

Dedications

3,821,640.—*George Bahder, Suffern,* and *Carlos Katz,* Spring Valley, N.Y. METHOD AND APPARATUS FOR ACCELERATED TESTING OF POWER CABLE INSULATION FOR SUSCEPTIBILITY TO TREEING. Patent dated June 28, 1974. Dedication filed Aug. 20, 1975, by the assignee, *Phelps Dodge Industries, Inc.*

Hereby dedicates the entire remaining term of said patent to the Public.

3,831,263.—*Stanley F. Dzierski,* Arnold, Pa. METHOD OF SOLDERING. Patent dated Aug. 27, 1974. Dedication filed Oct. 14, 1975, by the assignee, *Aluminum Company of America.*

Hereby dedicates to the Public the remaining term of said patent.

3,854,331.—*Charles H. Bateman, Jr.,* East Haven, *Allan A. Campbell,* Trumbull, and *James J. Capasso,* Shelton, Conn. VENTED TEST BARREL ASSEMBLY FOR REVOLVER AMMUNITION. Patent dated Dec. 17, 1974. Delication filed July 28, 1975, by the assignee, *Remington Arms Company, Inc.*

Hereby dedicates the remaining term of said patent to the Public.

3,885,293.—*Charles H. Bateman, Jr.,* East Haven, *Allan A. Campbell,* Trumbull, and *James J. Capasso,* Shelton, Conn. METHOD OF MAKING VENTED TEST BARREL ASSEMBLY FOR REVOLVER AMMUNITION. Patent dated May 27, 1975. Dedication filed July 28, 1975, by the assignee, *Remington Arms Company, Inc.*

Hereby dedicates the remaining term of said patent to the Public.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 22, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	2-21-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-13-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-13-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-6-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-21-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-23-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-2-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-11-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-5-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-13-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	7-10-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-25-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-26-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-18-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-17-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	4-23-75

Expiration of patents: The patents within the range of numbers indicated below expire during December 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,862,205 to 2,866,972 inclusive
Plant Patents..... Numbers 1,775 to 1,791 inclusive

REISSUES

DECEMBER 16, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,649

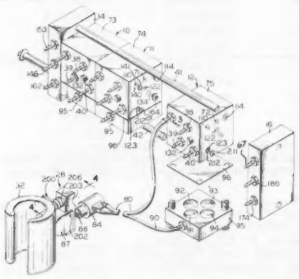
DENTAL HANDPIECE CONTROL

George K. Austin, Jr., P.O. Box 209, Rte. 2, Box 254, Newberg, Oreg. 97132

Original No. 3,638,310, dated Feb. 1, 1972, Ser. No. 869,088, Oct. 24, 1969. Application for reissue Sept. 27, 1974, Ser. No. 510,042

Int. Cl.[2] A61C 9/00

U.S. Cl. 32—22 **18 Claims**



1. In a dental handpiece control,

a solid control block having a drive air passage therethrough having an inlet and an outlet and a cooling fluid passage extending therethrough having an inlet and an outlet,

a diaphragm sheet positioned on a first face of the control block,

cover means secured to the outer face of the diaphragm sheet and the first face of the control block and having a pair of diaphragm actuating chambers therein,

the drive air passage having a pair of ports intermediate the inlet and outlet thereof and opening into *a portion of said first face opposite* one of the diaphragm chambers and adapted to be closed by the diaphragm sheet,

the cooling fluid passage having a pair of ports intermediate the inlet and outlet thereof and opening into [the other of] *a portion of said first face opposite* the diaphragm chambers and adapted to be closed by the diaphragm sheet,

an air driven dental handpiece,

air supply means supplying drive air under pressure to the inlet of the drive air passage,

cooling fluid supply means supplying a cooling fluid under pressure to the inlet of the cooling fluid passage,

air conduit means connecting the outlet of the drive air passage to the handpiece,

cooling fluid conduit means connecting the outlet of the cooling fluid passage to the handpiece,

second fluid supply means for supplying fluid under pressure to the diaphragm chambers,

valve means in said second fluid supply means for controlling the supply of fluid to said diaphragm chambers,

and hanger means serving to releasably support the handpiece *and operatively connected to and controlling the valve means* and operable by the weight of the handpiece [to close the valves and operable] *when the handpiece is positioned on the hanger means* to open the [valves] *valve means to permit fluid under pressure to flow to the diaphragm chambers thus to cause said diaphragm sheet to be pressed against said first face and prevent flow of air and cooling fluid through the respective passages therefor and operable* when the handpiece is lifted therefrom [,] *to close the valve means to shut off flow of fluid under pressure to the diaphragm chambers thus to permit movement of said diaphragm sheet away from said first face and permit flow of air cooling fluid through the respective passages therefor.* [and means under the control of the hanger means for supplying fluid under pressure to the diaphragm chambers.]

Re. 28,650

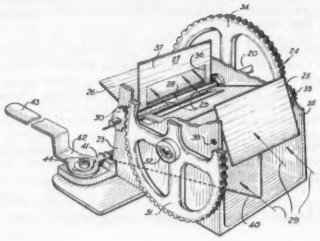
ADJUSTABLE SPEED AIR DRIVE-AIR SWEEP FOR AIR CONDITIONER

George W. Sisk, Jr.; Arthur W. Miller, and Frank Koleszar, all of Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Original No. 3,677,166, dated July 18, 1972, Ser. No. 33,403, Apr. 30, 1970. Application for reissue Oct. 19, 1973, Ser. No. 407,981

Int. Cl.[2] E06B 7/02

U.S. Cl. 98—94 **14 Claims**



1. In a variable directing apparatus for a fluid stream having means for defining a flowing fluid stream, movable fluid directing means for cyclically changing the direction of said stream on movement of said directing means, and fluid propelled rotatable means in said stream for moving said directing means due to a fluid force-caused rotation of said rotatable means, the improvement comprising adjustable means for adjustably regulating the speed of rotation of said rotatable means by said fluid stream and thus the movement of said fluid directing means.

Re. 28,651

STUMP REMOVAL MACHINE

Robert E. Welborn, Lafayette, Ind., assignor to FMC Corporation, San Jose, Calif.

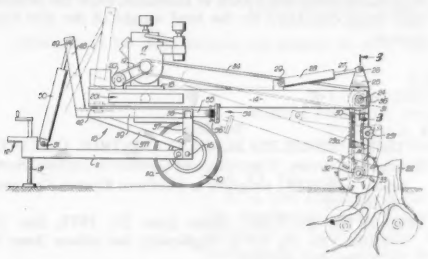
Original No. 3,625,267, dated Dec. 7, 1971, Ser. No. 884,218, Dec. 11, 1969. Application for reissue July 2, 1974, Ser. No. 485,173

Int. Cl.[2] A01G 23/06

U.S. Cl. 144—2 N **5 Claims**

12. A stump removal machine of the type comprising a vehicle having spaced, axially aligned wheels, an elongated boom extending rearwardly from said vehicle, means for pivotally mounting a forward portion of said boom on said vehicle including pivot means for providing up and down motion of the boom and pivot means for providing laterally swinging motion of the rearward end of the boom relative to the vehicle, an arm pivotally mounted on and depending from the rearward end portion of said boom, arm actuator means on said boom for oscillating said arm longitudinally of said boom, a rotary stump cutter on the lower end of said arm, and a motor for driving said stump cutter; the improvement wherein said means for pivotally mounting said boom on the vehicle comprises a carriage, pivot means mounting said carriage on the vehicle for pivotal motion about a generally horizontal axis for providing said up and down boom motion, carriage actuator means connected between said

vehicle and the carriage for pivoting said carriage about said generally horizontal axis to displace said arm and cutter up and down, pivot means mounting said boom on said carriage for



pivotal motion about a generally vertical axis that is forward of the axis of said wheels for providing said laterally swinging boom motion, said boom extending from said vertical axis pivot means across and rearwardly of said wheel axis, and actuator means connected between said carriage and the boom for laterally swinging said boom relative to said carriage.

Re. 28,652

AERODYNAMIC DEFLECTOR

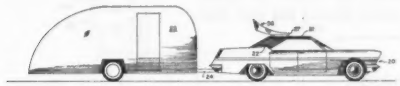
Johann T. Bildfell, London, Canada, assignor to Trail-Air Scoop Limited, London, Canada

Original No. 3,731,969, dated May 8, 1973, Ser. No. 142,467, May 12, 1971. Application for reissue June 25, 1973, Ser. No. 361,577

Claims priority, application Canada, Nov. 16, 1970, 098171

Int. Cl.[2] B62D *35/00*

U.S. Cl. 296—1 S **10 Claims**



1. An aerodynamic body for mounting on the top of a prime mover vehicle when pulling a trailing vehicle wherein a thrust is exerted on the aerodynamic body by virtue of the wind resistance of the moving prime mover vehicle while it proceeds along its line of travel, said body having an (effective) angle of attack inclined in relation to the prime mover vehicle and comprising a deflection member having an aerodynamic striking surface generally curved upward and rearwardly from a lower front portion to an upward rearward portion, the lower portion connecting to a surface of a leading edge member having one side thereof perpendicular to the line of travel and means thereon for disposing the body in near proximity and above the top of the prime mover vehicle such that wind striking the surface is deflected, in the lower portions, upward and outward away from the top of the prime mover vehicle and hence over the trailing vehicle.

Re. 28,653

METHOD OF FABRICATING SEMICONDUCTOR DEVICES

Bernard Thomas Murphy, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,649,386, dated Mar. 14, 1972, Ser. No. 723,529, Apr. 23, 1968. Application for reissue Aug. 10, 1972, Ser. No. 279,701

Int. Cl. H01l *7/36, 7/50*

U.S. Cl. 148—175 **5 Claims**

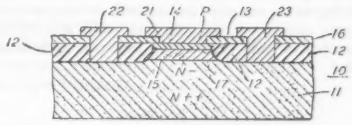
12. A method of fabricating a semiconductor device comprising the steps of:

first forming a semiconductive epitaxial layer on a semiconductive bulk portion, the bulk portion and the layer constituting a semiconductive body;

second forming on the surface of the epitaxial layer a first mask of a material having the characteristics that it resists etching in a first ambient which etches the semiconductor material, it inhibits oxidation of the underlying semiconductor material during a subsequent step in which the unmasked portion of the surface is oxidized, and it is removable by etching in a second ambient which attacks the mask but does not appreciably attack the grown oxide of the semiconductor material;

immersing the body in the first ambient so that the unmasked portions of the surface of the epitaxial layer are removed by etching at least partially through the epitaxial layer to form a mesa;

exposing the body at an elevated temperature to a second ambient sufficient to oxidize the unmasked portions of the epitaxial layer for a time sufficient that the oxide grown there extends essentially completely through the epitaxial



layer and planarity is substantially restored to the surface of the body;

removing the mask from the surface to expose the portions of the surface thereunderlying;

introducing impurities into the exposed semiconductor portions to modify the conductivity therein, this last-mentioned step using the aforementioned grown oxide as a second mask for enabling selective introduction of impurities into the exposed semiconductor regions; and

characterized in that:

1. *the semiconductor material is silicon;*
2. *the first forming step produces an epitaxial silicon layer which is about one micron thick on a thicker bulk portion and which is doped differently from the bulk portion;*
3. *the first mask is of a material selected from the group consisting of silicon nitride and aluminum oxide,*
4. *the unmasked regions are etched to a depth of about 0.7 micron, and*
5. *the first mask is removed by etching in a solution of hot phosphoric acid.*

Re. 28,654

METHOD FOR GLUING A STRIP OF MATERIAL AGAINST THE SIDE OF A FLAT WORK PIECE, LIKE A TABLE LEAF, AND A DEVICE FOR PERFORMING THIS METHOD

Gerardus P. Helmes; P. M. Helmes; Christiaan T. Helmes; Johan P. H. Helmes, and Franciscus J. Helmes, all of Steyl-Tegelen, Netherlands, assignors to Helmes Machinefabriek N.V., Netherlands

Original No. 3,655,479, dated Apr. 11, 1972, Ser. No. 811,098, Mar. 27, 1969. Application for reissue Oct. 24, 1973, Ser. No. 409,087

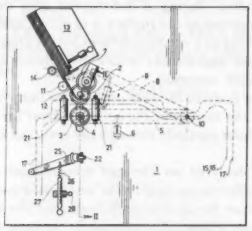
Claims priority, application Netherlands, Apr. 2, 1968, 6804576

Int. Cl.[2] B29C *17/02*

U.S. Cl. 156—212 **9 Claims**

1. An apparatus for applying an adhesive strip to a peripherally irregularly contoured edge of a panel comprising a base having a bed, a table supported freely on the bed of said base and shiftable horizontally thereon to allow rotary, rectilinear and general plane motions of said table, said table to support a panel and broadside relation thereto having a peripherally irregularly contoured edge, means to hold said panel to said table for rotary, rectilinear and general plane motions there-

with, a pressure roller overlying the periphery of the panel to press an adhesive tape against the edge of the panel as the panel moves with said table, a driven cam affixed to said table and having a peripheral surface conforming substantially to



the peripherally irregularly contoured edge of the panel, a driving means mounted on said base and engaging said cam to impart motion to said cam and table, and resilient means mounted on said base urging said cam against said driving roller.

Re. 28,655

PROCESS FOR THE PRODUCTION OF A REFORMING CATALYST

Jens Richard Rostrup-Nielsen, Virum, Denmark, assignor to Haldor Topsoe A/S, Soborg, Denmark

Original No. 3,791,993, dated Feb. 12, 1974, Ser. No. 81,534, Oct. 16, 1970. Continuation of Ser. No. 734,232, June 4, 1968, abandoned. Application for reissue May 8, 1974, Ser. No. 468,163

Claims priority, application United Kingdom, June 12, 1967, 27066/67

Int. Cl. B01j *11/22*

U.S. Cl. 252—466 J **8 Claims**

1. The process for the preparation of a precursor for a catalyst for reforming hydrocarbons which comprises the steps of mixing an aqueous solution of a salt selected from the group consisting of soluble salts of nickel, iron and cobalt, said solution further containing a substance selected from the group consisting of soluble salts of magnesium and dispersed, finely divided, reactive magnesium oxide, with another solution containing a member selected from the group consisting of sodium aluminate and potassium aluminate, and also containing an excess of base not chemically combined in the aluminate, to simultaneously and differentially coprecipitate a fine sludge of intimately mixed fine particles of aluminum hydroxide, a hydroxide of an element selected from the group consisting of nickel, iron and cobalt, and a member of the group consisting of magnesium hydroxide and magnesium oxide, then washing said sludge substantially free from sodium and potassium in any form and thereafter drying and dehydrating said sludge at a temperature of 300–750° C. to form an intimate mixture of oxides of magnesium, aluminum and of an element selected from the group consisting of nickel, iron and cobalt, and then calcining said oxides mixture at a temperature of 850°–1100° C. and wherein the starting materials are used in proportions so as to give the oxides mixture prior to calcination a content of 5–50% of an oxide selected from the class consisting of nickel, iron and cobalt oxides, 10–75% of magnesium oxide and 5–60% of aluminum oxide the percentages being calculated on the total weight of the said compounds.

Re. 28,656

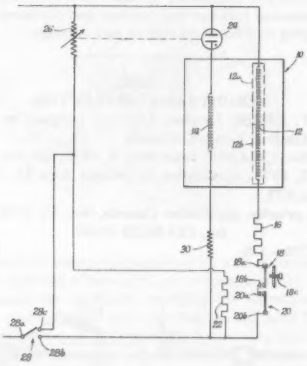
THERMOSTATLESS BLANKET CONTROL CIRCUIT

George C. Crowley, Winnetka, and Gordon S. Carlson, Northbrook, both of Ill., assignors to Northern Electric Company, Chicago, Ill.

Original No. 3,673,381, dated June 27, 1972, Ser. No. 192,181, Oct. 26, 1971. Application for reissue June 26, 1974, Ser. No. 483,213

Int. Cl.² H01H *37/00*

U.S. Cl. 219—212 **6 Claims**



1. An overload protection circuit for an electric blanket having a heating means and a sensing means *and a heat sensitive material* which has a resistance that decreases with increasing temperature, the sensing means being located in proximity in said blanket to said heating means and electrically coupled in parallel with *to* said heating means *by said heat sensitive material* comprising a diode filled with an ionizable gas which emits radiation when said gas is ionized; said diode being coupled in series with *connected between* said sensing means *and said heating means in parallel with said heat sensitive material*, control means having a pair of overload contacts which are coupled in series with said heating means and radiation responsive means coupled to said control means and positioned to receive said radiation from said diode; said control means being constructed to control the opening and closing of said overload contacts in accordance with the condition of said radiation responsive means wherein said condition changes in accordance with the radiation received by said radiation responsive means from said diode.

PLANT PATENTS

GRANTED DECEMBER 16, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,815
FLOWERING PEAR TREE
William Flemer III, Princeton, N.J., assignor to Treesearch, Kingston, N.J.
Filed July 16, 1974, Ser. No. 488,960
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—36 **1 Claim**

1. A new and distinct variety of flowering pear tree of the species botanically known as *Pyrus calleryana*, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a dense, robust and pyramidal habit of growth; large, glossy foliage; late flowering and leafing out habits, both of which are about ten days later than the variety "Bradford"; cessation of growth and ripening up of the wood earlier in the fall than the variety "Bradford"; and greater hardiness than the variety "Bradford," as evidenced by its ability to survive winters in central Vermont which killed "Bradford" outright in the same plantings.

3,816
CARNATION PLANT "BELLITA"
Maurits C. van Staaveren, 30 Hornweg, Aalsmeer, Netherlands
Filed Oct. 15, 1974, Ser. No. 514,427
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinct variety of carnation plant, substantially as herein shown and described, characterized by the strong color pattern of its flowers, the long strong stems on which the flowers are borne, and its vigorous and very tall growth habit.

3,817
MAPLE TREE
William Flemer III, Princeton, N.J., assignor to Treesearch, Kingston, N.J.
Filed Dec. 4, 1974, Ser. No. 529,513
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct variety of maple tree of the species botanically known as *Acer saccharum* "columnare," substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a spreading, broad oval tree shape; a more rapid growing habit as compared to ordinary sugar maples; good resistance to terminal injury from the feeding activities of leaf hopper insects, particularly when growing as young trees in nursery rows; and a distinctive and very attractive bright red leaf color during the fall season.

PATENTS

GRANTED DECEMBER 16, 1975

ERRATA

For CLASS	See PATENT NO.
350–218	3,925,910
062–121	3,926,000
062–378	3,926,001
096–067	3,926,436
312–107	3,926,483
123–148	3,926,557
428–095	3,926,700
252–063.5	3,926,916
424–177	3,926,921
252–522	3,927,083
197–019	3,927,274

NOTE-

Lester
Helm

U.S. Cl

1. A
distribu
helmet
baffles
entering
tion wit
outer sl
helmet
offset in
located
edge loc

John H.

U.S. Cl.

1. In c
like havi
edge of t
of the h
chin stra
securing
accident
cyclist d
secured i
strap for
connecti
fastening
strap to
attached
opening

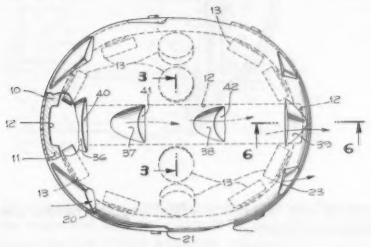
PATENTS

GRANTED DECEMBER 16, 1975

NOTE – A cross reference listing of applications published under Trial Voluntary Protest Program on January 28, 1975 is located in the back of this Issue. These entries will be in numerical order by document publication number.

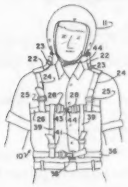
GENERAL AND MECHANICAL

3,925,821
AIR COOLED HELMET
Lester R. Lewicki, Woodland Hills, Calif., assignor to Bell Helmets Inc., Long Beach, Calif.
Filed July 5, 1974, Ser. No. 485,827
Int. Cl.[2] A42C *5/04*; A42B *3/00*
U.S. Cl. 2—3 R **15 Claims**



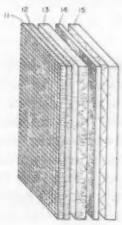
1. A protective helmet including an outer shell containing distributed openings through which air streams enter the helmet by virtue of advancing movements of the wearer, and baffles angularly positioned at said openings to direct the entering air streams rearwardly of the helmet in cooling relation with the interior, said baffles being one-piece with the outer shell and projecting inwardly toward and within the helmet interior, the baffles forming edges of the openings offset inwardly into the helmet interior, at least one baffle located at the helmet forward facing portion and having its edge located at the rearwardmost extent of said one baffle.

3,925,822
SAFETY HARNESS FOR A HELMET
John H. Sawyer, 247 Cary's Lane, Pensacola, Fla. 32507
Filed June 18, 1974, Ser. No. 480,572
Int. Cl.[2] A42B *1/08*
U.S. Cl. 2—3 R **5 Claims**



1. In combination, a crash helmet for motor cyclists or the like having an opening on each side thereof adjacent the lower edge of the helmet and a centrally disposed opening at the rear of the helmet adjacent the lower edge thereof and having a chin strap, a safety harness cooperating with the chin strap for securing said helmet on the head of the cyclist to prevent accidental dislodgement of the helmet from the head of the cyclist during an accident comprising a fastening element secured in each side opening of the helmet, a flexible shoulder strap for engaging over each shoulder of the cyclist, a flexible connecting strap removably and swivelly secured to each said fastening element and to each shoulder strap, a flexible chest strap to which the opposite ends of each shoulder strap is attached, a rear fastening element secured in the rear central opening of the helmet, a flexible back strap removably and swivelly secured at one end to said rear fastening element and at its other end to said chest strap, a flexible waist strap for encircling the waist of the cyclist, a right and left side flexible strap each secured at one end to said chest strap and at their opposite ends to said waist strap and a second flexible back strap secured at one end to said chest strap and at its other end to said waist strap.

3,925,823
WETTABLE FIRE FIGHTERS' GARMENT
Zelig Kupferman, Framingham, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Mar. 8, 1973, Ser. No. 340,611
Int. Cl.[2] A41D *31/02*
U.S. Cl. 2—81 **3 Claims**

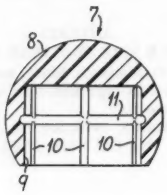


1. A non-reflective wettable fire fighters' suit for use in close proximity to and for brief emergency entry into fires where high heat fluxes are encountered comprising:
a plurality of layers of material assembled in suit form, said layers including an outer heat shield made of an open weave flame resistant fabric;
a next adjacent inner layer made of a fibrous batt having a capability of substantially instantaneously passing water therethrough, said batt being needled-punched to the open weave fabric so that the two fabrics are permanently interlocked;
a next adjacent inner layer made of a water absorbent fibrous felt material to act as a water reservoir and provide for the capillary transfer of water received through said outer heat shield and said fibrous batt;
a next adjacent inner layer made of a coated flame resistant nylon fabric to provide a barrier substantially impermeable to gas and liquids; and
a next adjacent inner quilted fabric lining made of insulating material to protect the wearer from the conductive heat of a fire after first having said garment saturated with water and thereafter periodically wetted while in close proximity to the fire,
whereby a person wearing the garment may closely approach a fire and remain in close proximity thereto for brief periods of time.

3,925,824
ENDOPROSTHETIC BONE JOINT DEVICES

Michael Alexander Reykers Freeman, London, and Sydney Alan Vasey Swanson, Carshalton, both of England, assignors to National Research Development Corporation, London, England

Filed May 9, 1974, Ser. No. 468,583
Int. Cl.² A61F 1/24
U.S. Cl. 3—1.912 **5 Claims**



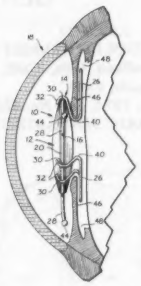
1. An endoprosthetic hip joint device comprising:
an acetabular component in the form of a socket member having an inner bearing surface concavely spherically shaped to not more than hemispherical extent, and a hemispherically shaped outer fixation surface formed with a shallow relieved configuration, said socket member being formed of metal with its inner and outer surfaces both being substantially hemispherical and concentrically located to define a thin uniform thickness therebetween,
and a femoral component in the form of a cap member having an outer bearing surface of convex majorspherical-segment shape in complementary, mutually articulatory engagement with said inner bearing surface, and a concave inner fixation surface of generally cylindrical shape coaxial with the axis of symmetry of said outer bearing surface and formed with a shallow relieved configuration,
said cap member being formed of a plastic material of significantly greater thickness between its respective inner and outer surfaces than said acetabular component; both of said fixation surfaces having relieved formations for receiving gap-filling medium in respective direct securement with the acetabulum and femur.

3,925,825
SUPPORTING SYSTEM FOR ARTIFICIAL INTRAOCULAR LENS

William Richards, Medway, and Bernard Grolman, Worcester, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Jan. 24, 1975, Ser. No. 543,735
Int. Cl.² A61F 1/16, 1/24
U.S. Cl. 3—13 **12 Claims**

1. A supporting system for an artificial intraocular lens comprising:
a rim adapted to extend about at least the major portion of the periphery of a lens to be supported by said system; and
at least one integral iris clip extending away from said rim, said clip including a portion adapted to partially overly at least one surface of said lens for preventing displacement

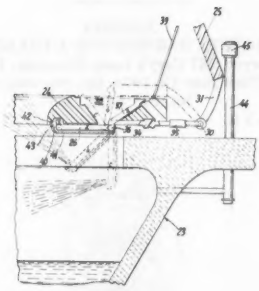


thereof from said rim in a final assembly of said lens and supporting system.

3,925,826
SANITARY APPARATUS

Robert Huyot, and Antje S. Huyot, both of 25 rue Laugier, 75017 Paris, France

Filed May 24, 1973, Ser. No. 363,734
Claims priority, application France, May 26, 1972, 72.18841; Apr. 25, 1973, 73.14914
Int. Cl. A47k 3/22
U.S. Cl. 4—7 **14 Claims**

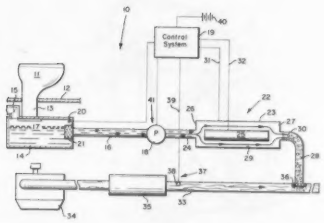


10. Sanitary apparatus comprising a bowl including a lowerable seat supported by said bowl, a flush nozzle mounted on the apparatus, manually operable lever means for moving said nozzle between an inoperative position and a plurality of operative positions along a vertical plane, means for manipulating said lever means from above said seat and for retracting said lever means below the upper surface of said seat and being manipulable from above said seat, means for rotating the nozzle about an axis perpendicular to said vertical plane; said nozzle being retractable to its inoperative position below the upper surface of said seat on said bowl and being housed wholly within said seat in the inoperative position of the nozzle and means being provided for connecting the nozzle with a water supply and connecting the bowl to a waste water outlet.

3,925,827
WASTE PRODUCTS INCINERATION SYSTEM FOR A VEHICLE OR THE LIKE

Bruce E. Wagenhals, Fountain Valley, Calif., assignor to Monogram Industries, Inc., Santa Monica, Calif.

Filed Apr. 3, 1974, Ser. No. 457,589
Int. Cl.² B60R 15/04
U.S. Cl. 4—114 10 Claims



1. In a waste products incineration system for use on a vehicle or the like wherein said vehicle includes an engine and an exhaust system having a tailpipe exhausting a stream of hot exhaust gases from the engine to the atmosphere, the system further including a toilet mounted on said vehicle, a holding tank mounted on said vehicle in fluid communication with said toilet for receiving waste products therefrom, conduit means extending from fluid engagement with the interior of said holding tank into fluid engagement with the stream of exhaust gases passing through said tailpipe, and normally inactivated pumping means associated with said conduit means for selectively pumping a slurry of waste products from said holding tank to said tailpipe, the improvement which comprises:

electrolysis means disposed between said pumping means and said tailpipe for electrolytically converting said slurry into a deodorized and disinfected foam before entry thereof into said tailpipe whereby solids in said foam are completely burned and liquids in said foam are completely evaporated when said foam comes into contact with the hot exhaust gases in said tailpipe thereby discharging said waste products out of said tailpipe as totally harmless gases.

3,925,828
PORTABLE SHOWER

Sunyong P. Kim, 3885 S. Norton Ave., Los Angeles, Calif. 90008

Filed June 8, 1973, Ser. No. 368,188
Int. Cl.² A47K 3/22; F24H 1/06
U.S. Cl. 4—147 5 Claims

1. A portable shower comprising:

a box-like shaped housing formed of a thin plastic material, said housing having a water tight bottom and having a zippered opening on the front side wall thereof;

a pair of brackets extending from the sidewall of a camping vehicle, the upper corners of said boxlike shaped housing being suspended from said brackets;

a stand disposed on the bottom of the interior of said housing;

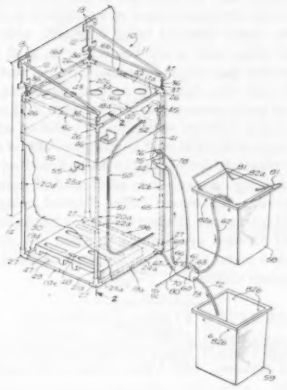
a shower head fixture within said housing, said shower head fixture including a length of hose having a coupler on the end thereof, said coupler extending through the sidewall of said housing, said housing having an outlet tube extending from the bottom of a sidewall thereof;

a first and second container positioned outside said housing;

a pump having a supply portion and a return portion, said supply pump portion having a supply inlet and a supply outlet, and said return pump portion having a return inlet and a return outlet;

a first length of supply hose connecting said first container to the supply inlet of said supply pump portion;

a second length of supply hose connecting the supply outlet of said supply pump portion to said coupler;



a first length of return hose connecting the outlet tube on the bottom of said housing to the return inlet of said return pump portion;

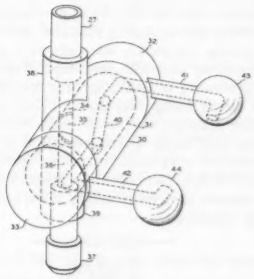
a second length of return hose connecting the return outlet of said return pump portion to said second container; and

a remote switch actuator having a knob disposed within said housing for controlling the actuation of said pump.

3,925,829
EMERGENCY EYE WASH FOUNTAIN APPARATUS

Howard W. Bost, 1334 Quail Drive, Bartlesville, Okla. 74003

Filed Aug. 12, 1974, Ser. No. 496,920
Int. Cl.² A61H 33/04
U.S. Cl. 4—166 5 Claims



1. An eye wash fountain for mounting on a sink faucet comprising:

a valve body having a normally fixed portion and a swivel portion pivotally attached to said fixed portion, said fixed and swivel body portions having major flat abutting surfaces in a plane perpendicular to the axis along which said body portions are pivotally attached, and

a pair of spray heads rigidly connected to said swivel portion of said valve body by two conduit means adapted to position said spray heads in a forward eye-flushing position or a back out-of-use position,

said fixed body portion having an inlet channel connectable to a sink faucet and passing straight through said fixed

body portion with the outlet end of said inlet channel lying in said abutting surface of said fixed body portion, and

said swivel body portion having first and second outlet channels,

said first outlet channel passing straight through said swivel body portion with the inlet end of said first outlet channel lying in said abutting surface of said swivel body portion, said first outlet channel being alignable with said inlet channel when said spray heads are in said out-of-use position and thus aligned directed to pass water straight through said valve body for normal faucet use, and

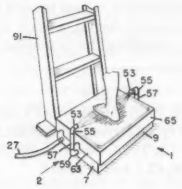
said second outlet channel passing through said swivel body portion in a Y-shape with the inlet end of said second outlet channel lying in said abutting surface of said swivel body portion and the two outlet ends of said second outlet channel being connected to said conduit means of said spray heads, said second outlet channel being alignable with said inlet channel when said spray heads are swiveled into said forward eye-flushing position and thus aligned directed to divert water from said inlet channel to each of said conduit means.

3,925,830

FOOT SHOWER AND SPRAY DEVICE

Francis Bud Delaney, 608 Curry Road, Schenectady, N.Y. 12306

Filed Mar. 17, 1975, Ser. No. 559,006
Int. Cl.² A47K *3/12*
U.S. Cl. 4—182 **8 Claims**



1. A foot shower and spray device comprising a base, actuating platform, valve means, and shower and spray means; said base mounting said actuating platform and said valve mean, said base having upstanding sidewalls, said actuating platform having depending sidewalls, said depending sidewalls receiving said upstanding sidewalls in such mounting relationship, said valve means being adapted for connection with a water source under pressure, said valve means being connected with said shower and spray means, and said actuating platform being operatively connected to said valve means to open said valve means to establish communication of said water source with said shower and spray means upon said actuating platform being depressed.

3,925,831

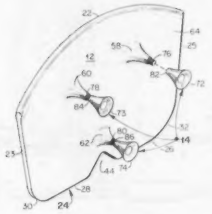
SAFETY PANEL FOR BATHTUBS

Roger S. Perkins, 2129 Eveningside Drive, West Covina, Calif. 91792

Filed Nov. 15, 1974, Ser. No. 524,031
Int. Cl.² A47K *3/14*
U.S. Cl. 4—183 **6 Claims**

1. A safety panel adapted to partition a bathtub adjacent the forward end thereof which includes spigot or water control knobs means projecting therefrom, said bathtub including a bottom and bottom side edges comprising

rigid planar panel means including front and rear faces and dimensioned to approximate the vertical cross-section taken substantially transverse to the longitudinal dimension of said bathtub, said panel including a generally rounded upper edge and a bottom edge, said bottom edge having opposite corners that are radiused to define with the bottom side edges of said bathtub passageways for the flow of water past said panel, said bottom edge being recessed generally centrally thereof to define with the bottom of said bathtub a further passageway for the flow of water past said panel, and



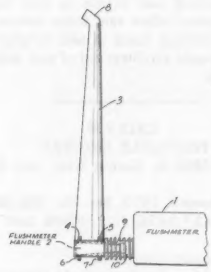
a plurality of spacer means extending generally perpendicularly from that face of said panel facing said forward end of said bathtub and releasably engaging said forward end to position said panel spaced apart from said forward end of said bathtub and beyond the outboard ends of said spigot or water control knobs means.

3,925,832

FLUSHOMETER DEVICE

John Falzone, Brooklyn, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Dec. 16, 1974, Ser. No. 533,298
Int. Cl.² F16D *1/06*
U.S. Cl. 4—249 **2 Claims**



1. A flushometer device for a flushometer having a handle extending substantially horizontally therefrom for operating the flushometer, when it is moved in predetermined directions, said flushometer device comprising

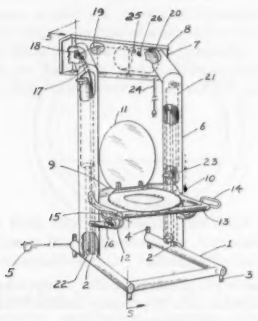
a handle extension; and

fastening means removably affixing the handle extension to the handle of a flushometer in a manner whereby the handle extension extends substantially vertically from the handle whereby movement of the handle extension in predetermined directions moves the handle in corresponding predetermined directions to operate the flushometer, said fastening means comprising a plurality of screws threadedly coupled in internally threaded bores formed through the handle extension and in close abutment with the handle of the flushometer.

3,925,833
PORTABLE ELECTRIC HYDRAULIC JOHNNY AID

Australia Hunter, 1540 E. Ocean Front, Balboa, Calif. 92661

Continuation-in-part of Ser. No. 259,738, June 5, 1972, abandoned. This application Mar. 8, 1974, Ser. No. 449,521
Int. Cl.² A47K 17/02
U.S. Cl. 4—251 10 Claims



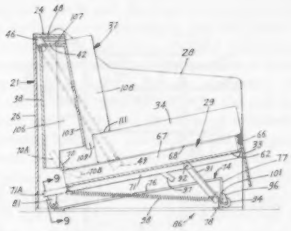
1. A transfer device to assist an infirm person in using a toilet bowl, comprising frame means arranged to be positioned over a toilet bowl, said frame means including a U-shaped horizontal base member with the opening in the U-shaped base member being in the rear thereof for receiving a toilet bowl, a toilet seat means, said U-shaped base member having upstanding vertical support elements on opposite side portions of said U-shaped base member adjacent the opening therein, respective movable side frame members slidably interengaged with said support elements, means to secure the toilet seat means to said side frame members, means to constrain said side frame members to upward and downward vertical movement relative to said base member, whereby said toilet seat means is constrained to upward and downward movement in a straight line relative to said base member, reciprocating drive means on said frame means, means connecting said drive means to said toilet seat means and being arranged to move the toilet seat means vertically responsive to energization of said drive means, and means to selectively energize said drive means for upward and downward movement of the toilet seat means, whereby to assist an infirm person using the device to assume a standing position from a sitting position, and vice versa, without forward or rearward movement while maintaining the toilet seat means horizontal and enabling the person to maintain supportive contact with the forward edge of the toilet seat means.

3,925,834
BED AND LOUNGE UNIT

Clarence R. Johnson, Duluth; Jay T. Kidder, Minneapolis, and Orlando N. Talarico, Duluth, all of Minn., assignors to The Tilt-A-Bed Corporation, Minneapolis, Minn.

Filed June 14, 1974, Ser. No. 479,222
Int. Cl.² A47C 17/14
U.S. Cl. 5—13 17 Claims

1. In a combination bed and lounge unit having a frame and mattress assembly selectively movable to a bed position and a seat position: said frame having a member located below said mattress assembly, support means movably connected to the mattress assembly and carrying wheel means movably supporting at least a part of said mattress assembly relative to said member of the frame, said support means having a cross member, arms secured to opposite ends of the cross member, pivot means pivotally connecting the arms to the mattress assembly, said cross member movable to a position behind said member of the frame to hold the mattress assembly in the seat position and movable ahead of said member of the frame

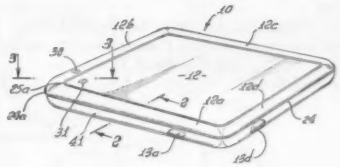


to allow said mattress assembly to be moved to the bed position.

3,925,835
FRAMELESS SAFETY WATER BED

William Pennington, and William Pennington, III, both of 30200 Oceanaire Drive, Palos Verdes Peninsula, Calif. 90274

Continuation-in-part of Ser. No. 221,589, Jan. 28, 1972, Pat. No. 3,787,907. This application July 1, 1974, Ser. No. 484,966
Int. Cl.² A47C 27/08
U.S. Cl. 5—348 WB 4 Claims



1. In a water bed, the combination comprising
   a. plastic sheet structure defining a main water compartment and an air pressure compartment extending in a generally horizontal loop bounding the water compartment, and
   b. an additional and separate safety sheet attached to said sheet structure and extending in closely underlying relation to the air and water compartments to receive and retain any water leakage from the water compartment,
   c. the safety sheet being peripherally bonded to the sheet structure along a locus bounding the main extent of the air compartment and at an elevation generally above the bottom level of the water compartment.

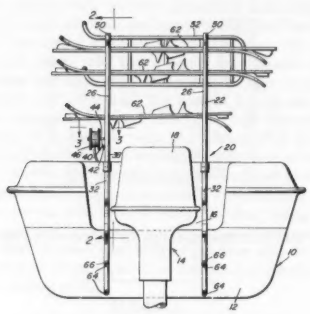
3,925,836
TRANSOM MOUNTED SKI RACK AND TOW ROPE REEL SUPPORT

Harold V. Simmonds, R.R. #4, Box 145, Greenville, Ill. 62246

Filed Sept. 18, 1974, Ser. No. 507,069
Int. Cl.² A63C 11/00
U.S. Cl. 9—1 D 9 Claims

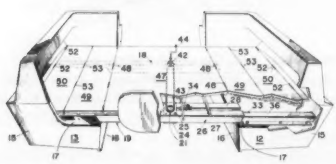
1. A support rack for water skis and the like to be stored exteriorly of the cockpit of a boat, said rack comprising a pair of uprights having upper and lower end portions and including mounting means on their lower end portions for support of said uprights in a stationary manner from opposite side portions of the rear of a boat hull, the upper end portions of said uprights including vertically spaced pairs of horizontally aligned forwardly projecting shelves, each of said shelves including releasable clamp means for clampingly engaging the corresponding end portion of a water ski supported therefrom

and having its other end supported from the corresponding shelf of the other upright, said mounting means includes a plurality of elongated front to rear extending mounting studs



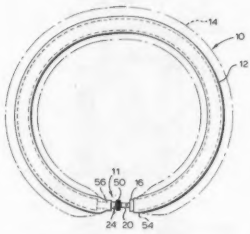
adjustably secured through said lower end portions and including forward ends adapted to be secured through the transom of a boat.

3,925,837
BOAT HULL CONSTRUCTION
Keith Roy Phillip Miller, 183 Main St., Ailsa Craig, Ontario, Canada
Filed Sept. 18, 1974, Ser. No. 506,948
Claims priority, application Canada, Dec. 13, 1973, 189243
Int. Cl.² B63B 7/00
U.S. Cl. 9—2 R **2 Claims**



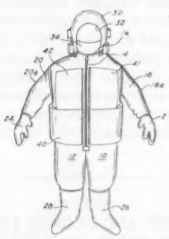
1. A boat comprising:
a. a hull of two juxtaposed hollow sections, each section including a plate and an enclosing body portion, the plate being essentially flat and longitudinally extending as a side of the section across the body portion to form a hollow member or section therewith;
b. struts interconnectingly mounted fore and aft on each of the hollow sections and essentially at right angles to the plates to dispose the plates relatively proximate and substantially parallel to each other; and
c. gear means including interconnected fore and aft arrangements of a hollow parallel guide into which a strut from each hollow section telescopingly is adapted to move and means for relatively moving and constraining the struts within the guides comprising a fore and aft gear box mounted on the guides and containing a pinion gear, each strut disposing a rack along one margin which engages the pinion gear, and link means for connecting the fore and aft gear boxes whereby rotation of one pinion gear transmits rotation to the other pinion gear and relative movement of the fore and aft struts and hollow sections whereby the sections may be selectively disposed in adjacent juxtaposition or separated at will.

3,925,838
INFLATABLE LIFE PRESERVER
Patrick Hayes Kennedy, 1780 Lawrence Ave. East, Scarborough, Ontario, Canada
Continuation-in-part of Ser. No. 502,434, Sept. 3, 1974, abandoned. This application Dec. 6, 1974, Ser. No. 530,139
Int. Cl.² B63C 9/16
U.S. Cl. 9—319 **10 Claims**



1. An inflatable life preserver collar comprising:
a toroidal, tubular core of pressure resistant material forming a first closed chamber;
a first inflatable tubular membrane mounted coaxially on the core and forming a second, annular closed chamber about the core;
passage means connecting the first chamber and the second chamber;
valve means located in the passage means; and
means, actuable on the application of axial force to the collar, to open the valve means for the passage of pressurized gas from the first chamber into the second chamber.

3,925,839
SURVIVAL SUIT
James W. Smith, 557 Milwaukee St., Denver, Colo. 80206
Filed Apr. 17, 1974, Ser. No. 461,492
Int. Cl.² B63C 9/10
U.S. Cl. 9—331 **5 Claims**



1. A cold water survival suit comprising:
a. a body covering of closed-cellular material having a thickness of approximately three-sixteenths inch to one-fourth inch, said body covering having inside and outside surfaces and having a waist portion, a chest portion, a hood portion, glove portions, and boot portions, said hood portion having a front and back and an opening in the front for the face of the user;
b. head flotation means in band form and of essentially the same material as said body covering, said head flotation means being contiguously joined with said outside surface of said body covering at said hood portion thereof and extending around the back of said hood portion for holding a user's head high in the water;

c. waist flotation means in the form of a wide band of essentially the same material as said body covering, said waist flotation means being contiguously joined with said outside surface of said body covering, said waist flotation means extending around said waist portion of said body covering;

d. chest flotation means of essentially the same material as said body covering, said chest flotation means being contiguously joined with said outside surface of said body covering at said chest portion thereof;

e. all regions of said suit having an essentially solid cross section substantially free of voids other than those within the cells of said closed-cellular material;

f. whereby the buoyancy and protective properties of said suit are maintained even if said outside surface is damaged.

3,925,840

VEHICLE FOR TRANSPORTING BRIDGE SECTIONS

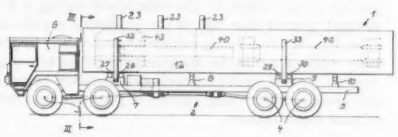
Gerhard Wagner, Mainz-Lerchenberg, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Filed Oct. 21, 1974, Ser. No. 516,418

Claims priority, application Germany, Oct. 23, 1973, 2353019

Int. Cl.[2] E01D *1/00*

U.S. Cl. 14—1 14 Claims



1. A vehicle for transporting bridge sections each comprising at least a pair of bridge beams; said vehicle including means for supporting said sections on longitudinal side by side relation with the roadway forming sides of the beams parallel to the vertical, each beam having coupling means at one end for connection to the other beam of the respective section, one beam of each section being toward the outside of the vehicle and the other beam of each section being adjacent the said one beam toward the center of the vehicle, the coupling means of said one beam of each section being at the forward end of the vehicle and the coupling means of the other beam of each section being toward the rearward end of the vehicle.

3,925,841

ROTARY TOOTHBRUSH

Joseph L. Caliendo, 578 Driggs Ave., Brooklyn, N.Y. 11211

Filed Mar. 4, 1974, Ser. No. 447,575

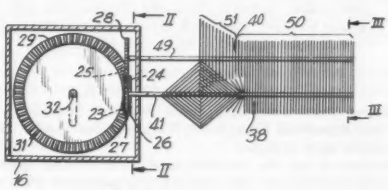
Int. Cl.[2] A46B *13/02*

U.S. Cl. 15—23 4 Claims

1. A rotary toothbrush for brushing all the teeth of a jaw, said teeth being in a substantially U-shaped pattern with front teeth at the curvilinear portion of the pattern and side teeth at the substantially linear portions of the pattern and each tooth having an inner surface on the inside of the U-shaped pattern, an outer surface on the outside of the U-shaped pattern and a bite surface facing the bite surfaces of the teeth of the other jaw, said toothbrush comprising

a housing;

first, second, third, fourth, fifth and sixth substantially linearly extending brushes rotatably mounted at one end in the housing and positioned so that the first brush operatively abuts a corresponding one of the inner surfaces of substantially half the front teeth and the corresponding side teeth, the second brush operatively abuts the outer surfaces of substantially half the front teeth and the corresponding side teeth and the third brush operatively abuts the bite surfaces of substantially half the front teeth and the bite surfaces of the corresponding side teeth, the first brush comprising a substantially linear rod having a first plurality of substantially radially extending bristles in planes substantially perpendicular to the rod in the area of the side teeth, a second plurality of substantially radially extending bristles in planes inclined at angles opening away from the first plurality of bristles in the area of the inner surfaces of the front teeth and a third plurality of substantially radially extending bristles in planes inclined at angles opening toward the first and second pluralities of bristles in the area of the outer surfaces of the front teeth, the bristles of each of the second and third pluralities of bristles substantially abutting each other in a plane substantially perpendicular to the rod and the bristles of each of the second and third pluralities of bristles increasing in length substantially in proportion with the distance from said plane, the bristles of each of the second and third pluralities of bristles forming substantially conical configurations, the second brush comprising a substantially linear rod having a first plurality of substantially radially extending bristles in planes substantially perpendicular to the rod in the area of the side teeth, the bristles



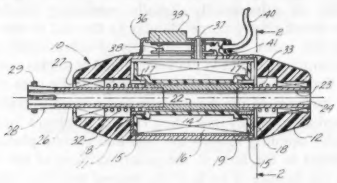
of the first plurality of bristles having substantially equal lengths, and a second plurality of substantially radially extending bristles in planes substantially perpendicular to the rod, the bristles of the second plurality of bristles increasing in length substantially in proportion with the distance from the first plurality of bristles in a flared configuration, and the third brush comprising a substantially linear rod having a first plurality of substantially radially extending bristles in planes substantially perpendicular to the rod in the area of the side teeth, the bristles of the first plurality of bristles having substantially equal lengths, and a second plurality of substantially radially extending bristles in planes substantially perpendicular to the rod, the bristles of the second plurality of bristles increasing in length substantially in proportion with the distance from the first plurality of bristles in a flared configuration, the fourth of the brushes being identical to the first brush and abutting the inner surfaces of the other half of the front teeth of the jaw and the inner surfaces of the corresponding side teeth, the fifth of the brushes being identical to the second brush and abutting the outer surfaces of the other half of the front teeth and the outer surfaces of the corresponding side teeth and the sixth of the brushes being identical to the third brush and abutting the bite surfaces of the other half of the front teeth of the jaw and the bite surfaces of the corresponding side teeth; and

motive means in the housing coupled to the brushes for rotating the brushes about their axes in predetermined directions.

3,925,842
POWER ERASER

Bjorn P. Selinder, and Bo Eric Selinder, both of San Pedro, Calif., assignors to Semo Incorporated, Fallon, N.Y.

Continuation of Ser. No. 403,679, Oct. 4, 1973, abandoned.
This application Feb. 21, 1975, Ser. No. 551,594
Int. Cl. H02k *33/02*
U.S. Cl. 15—3.53 9 Claims

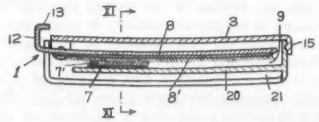


1. A power eraser comprising:
a housing;
a chuck means adapted to hold an elongated rod-shaped eraser element;
an elongated eraser element secured in and extending from the chuck means, the eraser element being of a type specifically adapted for removing marks from paper and the like; and
linearly reciprocating drive means secured to the housing and to the chuck means for oscillating the chuck means and eraser element along the longitudinal axis of the eraser element, the chuck means being substantially free of movement lateral to the eraser-element axis.

3,925,843
CLEANING BRUSH DEVICE

Teruya Tsuruzawa, 22-8, Nishi 3-chome, Senriyama, Suita, and Muneyuki Ueda, 6-23, Kurakuen Sanbancho, Nishinomiya, both of Japan

Division of Ser. No. 395,000, Sept. 7, 1973. This application Oct. 29, 1974, Ser. No. 518,933. The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.
Claims priority, application Japan, Sept. 9, 1972, 47-90719
Int. Cl.² A46B *17/04*
U.S. Cl. 15—184 3 Claims

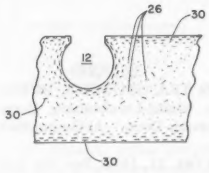


1. A cleaning brush device comprising: a relatively flat casing having an opening at one end; a guide plate positioned within the casing and defining first and second regions therein, said guide plate having a length less than the length of said casing, whereby said regions are in communication with one another in the vicinity of said casing opening; a first brush member formed on said guide plate; a second brush member adapted to be inserted into and pulled out of said casing through said opening, said second brush member being positioned within said first region for storage, and positioned within said second region when using said brush; short bristles closely implanted on one surface of the first brush member to form a dust removing surface; short bristles closely implanted on one surface of the second brush member to form a cleaning brush surface, bristles on the first brush surface being inclined in the direction away from said opening; the bristles on the second brush member being inclined in the same direction as the bristles on the first brush member, the bristles of said first brush member and said second brush member being engageable with one another as the second brush member is inserted into or pulled out of the casing; and means for holding the pulled-out second brush member on the casing when inserted in the second region so that the cleaning brush surface thereof is exposed so as to be engageable with an article to be cleaned for brushing.

3,925,844
FIBER-LOADED WINDSHIELD WIPER SUPERSTRUCTURE

Irwin C. Cone, Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed July 15, 1974, Ser. No. 488,372
Int. Cl.² B60S *1/02*
U.S. Cl. 15—250.42 11 Claims

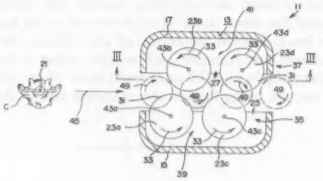


1. An elongated yoke for a windshield wiper superstructure comprising:
a polymeric matrix in which is embedded through at least a portion of the length of the yoke fibers having a tensile strength greater than that of the polymeric matrix alone, more of said fibers being oriented substantially longitudinally with respect to the elongated yoke than in any other single direction, such longitudinal orientation being more prevalent near the outer surface of the yoke than inward of such outer surface.

3,925,845
CARCASS POLISHER

Donald L. Arendale, 2516 Boysenberry, Bartlett, Tenn. 38134

Filed Apr. 25, 1974, Ser. No. 464,154
Int. Cl.² A22B *5/08*
U.S. Cl. 17—18 12 Claims



1. Apparatus for removing scurf and singed hair from a carcass, said apparatus comprising frame means having a pair of frame elements, means for suspending and moving the carcass laterally between said elements, means for enabling the carcass to be free to rotate about a vertical axis as it moves between said elements, and multiple pairs of cylindrical like shaped scrub brushes rotatably attached to said frame means, said scrub brushes being rotatably driven about their respective vertically disposed axes for vigorously engaging and scrubbing the carcass and imparting a twirling action thereto to present substantially the entire area of the outer surface of the carcass to each of said rotating scrub brushes as the scurf and singed hair are scrubbed therefrom, said scrub brushes being arranged in first and second rows with each of said pairs of said multiple pairs thereof having one brush in said first row and one brush in said second row, the scrub brushes in said

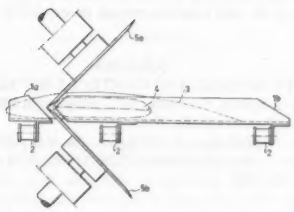
first and second rows respectively having spaced distances therebetween, the rotating axes of said scrub brushes in said first row being arranged alternately with said spaced distances in said second row whereby the carcass alternately encounters individual rotating brushes on either side thereof as it passes laterally between said frame elements.

3,925,846

METHOD OF REMOVING THE HARD AND SOFT ROE SACKS, RESPECTIVELY, FROM FISHES AND APPARATUS FOR CARRYING OUT THIS METHOD

Leif Leander, Vastra Frolunda, Sweden, assignor to Arenco KM-AB, Vastra Frolunda, Sweden

Filed Feb. 7, 1974, Ser. No. 440,388
Claims priority, application Sweden, Feb. 22, 1973, 7302338
Int. Cl.² A22C 25/14
U.S. Cl. 17—60 14 Claims



1. Apparatus for removing the hard and soft roe sacks, respectively, from a fish, comprising

a. a head severing station including means for severing the head of the fish by a V-shaped cut, the legs of which extend transversely of and at acute angles to the longitudinal direction of the fish;

b. a belly cutting station which comprises an edged cutting tool for cutting the belly of the fish in its longitudinal direction, and protective means for preventing engagement of the hard and soft roe sacks, respectively, with the edge of the cutting tool;

c. a hard and soft roe sack, respectively, squeezing out station comprising compressing means which are located for substantially symmetrical engagement with the sides of the fish and are pressable against an initially narrow area of said fish located between the longitudinal central lines of the hard and soft roe sacks, respectively, and the upper contour of said sacks, and means for successively displacing said compressing means downwards towards the belly of the fish, for successively squeezing out of the hard and soft roe sacks, respectively, through the opening cut in the belly of the fish;

d. a separation station including means for removing the dependent hard and soft roe sacks, respectively; and

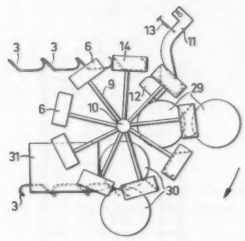
e. transport means for advancing the fish first substantially perpendicular to its longitudinal direction through the head severing station and then substantially in the longitudinal direction of the fish through the subsequent stations, in the order stated above.

3,925,847

METHOD AND APPARATUS FOR MEASURING AND POSITIONING OF FISH AT HEAD CUTTING

Leif Leander, and Curt Eriksson, both of Vastra Frolunda, Sweden, assignors to Arenco-KM AB, Vastra Frolunda, Sweden

Filed Aug. 2, 1973, Ser. No. 384,899
Int. Cl.² A22C 25/14
U.S. Cl. 17—63 7 Claims



1. Apparatus for measuring fish and positioning them in an optimum position for deheading, said apparatus comprising 'a first conveyor having a path of movement and having a plurality of fish boxes carried thereby, each of said fish boxes being adapted to advance a fish carried thereby sideways with the fish head located on a particular side thereof,

a second conveyor having a path of movement extending adjacent and substantially parallel to part of the path of movement of said first conveyor and having a plurality of head boxes carried thereby,

sensing means for determining the thickness of a fish carried by a fish box in the region of the fish located immediately behind the eyes of the fish,

means for locating said sensing means in an interspace between the respective paths of movement of said fish boxes and said head boxes,

means for moving each of said plurality of head boxes of said second conveyor in synchronism with and in the same direction as and directly opposite to an individual fish box of said first conveyor along a portion of the path of movement of said second conveyor,

means for displacing each of said head boxes toward and away from an individual fish box in the longitudinal direction of a fish resting in said fish box,

a first control means fixedly mounted with respect to the paths of movement of said conveyors for actuating second control means in response to said sensing means,

a plurality of second control means for controlling said head box displacing means to optimum locations, a second control means connected to each of said head boxes and movable therewith in the path of movement of said second conveyor and for controlling said head box displacing means to move its connected head box longitudinally to an optimum location dependent upon the measured thickness of the fish in its connected head box, and

means for locking each head box at said optimum position.

3,925,848

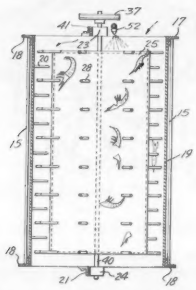
SHRIMP DEHEADER

Hubert Ward, 1412 Choctaw Avenue, Metairie, La. 70005

Filed June 29, 1973, Ser. No. 375,151
Int. Cl.² A22C 29/00
U.S. Cl. 17—71 10 Claims

1. A shrimp deheading apparatus comprising an upstanding stationary cylindrical shell member having an axis which is disposed closer to the vertical than to the horizontal, a rotary drum member substantially coaxially mounted in said shell member, means to rotate said drum member with respect to said stationary shell member, said drum member having a

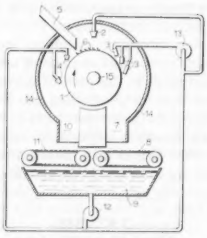
circular top wall for receiving shrimp to be deheaded which is slightly less in diameter than the said shell member so as to define an annular space between the drum member and the shell member of just sufficient radial width to receive shrimp lengthwise from said drum top wall, a plurality of inwardly extending pin elements on the interior surface of said shell member terminating closely adjacent the peripheral surface of the drum member, a plurality of outwardly extending pin elements on the drum member extending toward and terminating closely adjacent the interior surface of the shell member, the pin elements on said shell member being of different elevations than the pin elements on the drum member, and means for spraying water downwardly onto the central portion of the top wall of said drum member to facilitate outward sliding movement of shrimp and assist centrifugal force in moving shrimp toward said annular space, whereby shrimp deposited on said top wall of the rotary drum member are fed by centrifugal force to said annular space in which the shrimp drop by gravity and are engaged by the pin elements to dehead the shrimp.



3,925,849
FLUID IMPACT GIN

Anselm C. Griffin, Jr., Leland, Miss., and Harold Watson, Auburn, Ala., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 19, 1974, Ser. No. 525,129
Int. Cl.² D01B *1/04*
U.S. Cl. 19—48 **9 Claims**



1. An apparatus and system for removing cottonseeds from cotton fiber comprising:

a. a horizontal rotating cylinder comprising:

1. a saw toothed external surface with which to enmesh the cotton fibers,
2. a means of rotating the cylinder in a clockwise direction,

b. a system of low pressure nozzles to wet the cotton fiber and mingle the cotton fiber with the metal saw teeth, and

c. a means of supplying fluid to said low pressure nozzles,

d. a system of high pressure impact nozzles directing the impacting fluid stream tangentially to the horizontal rotating cylinder thereby forcibly removing the cottonseed from the fibers while retaining the fibers in the saw teeth of the rotating cylinder, and

e. a means of supplying high pressure fluid to said high pressure impact nozzles,

f. a means gathering and directing spent fluid and cottonseed released by said nozzles, and

g. a means receiving and separating said gathered fluid and cottonseeds and conveying the cottonseeds away from the apparatus for further processing,

h. a means of retaining said separated impacting fluid in storage,

i. a system of doffing nozzles to remove the cotton fibers from the teeth on the surface of the horizontal rotating cylinder, and

j. a means of supplying fluid to said doffing nozzles,

k. a means of gathering and directing the spent fluid and cotton fibers released by said doffing nozzles,

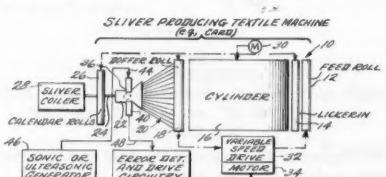
l. a means receiving and separating said gathered fluid and cotton fibers and conveying the cotton fiber away from the apparatus for additional processing,

m. an enclosure encompassing said cylinder and said nozzle systems thereby directing splash fluid to the said gathering and directing means described in (f) and (k) and thence to said retaining means described in (h).

3,925,850
DENSITY SENSING AND CONTROLLING EQUIPMENT

Kenneth G. Lytton, Gastonia, N.C., assignor to Fibers Controls Corporation, Gastonia, N.C.

Filed Nov. 1, 1973, Ser. No. 411,842
Int. Cl.² D01G *15/36;* G01N *9/24*
U.S. Cl. 19—98 **9 Claims**



1. Textile sliver density sensing apparatus comprising:

a textile processing machine for producing a multiplicity of spaced parallel fiber strands,

funnel shaped strand collector means having a throughput aperture for collecting said strands and producing a sliver in said aperture,

means for drawing said sliver through said aperture constantly,

means including a transmitting transducer for transmitting into said sliver a compression wave in the sonic ultrasonic frequency range,

a receiving transducer for receiving the part of said wave that passes through said sliver, and

circuit means connected to said receiving transducer for electrically determining the sliver density deviation from a predetermined norm based on the amount of said wave that passes through said sliver,

said strand collector having a cone shaped receiving section and a tube-like shaped section connected thereto with said throughput aperture extending from the apex of said cone section through said tube section,

said tube-like section having transverse apertures in two opposing sides adjacent said apex and in communication with said throughput aperture,

said transducers being respectively disposed adjacent said opposing sides of said tube-like section and in open communication with each other through said transverse and throughput apertures, and

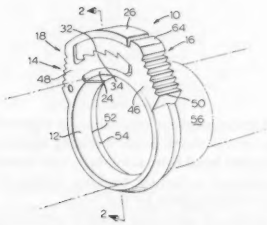
wherein said throughput aperture in said tube-like section has a width substantially greater than the width of said aperture at the apex of said cone section.

3,925,851

PLASTIC HOSE CLAMP

Douglas L. Bevans, 134 Dornie Road, Oakville, Ontario, Canada

Filed May 20, 1974, Ser. No. 471,359
Int. Cl.² B65D *63/02*
U.S. Cl. 24—20 TT **1 Claim**



1. A plastic hose clamp comprising in combination an open-ended hose-surrounding band and a clamping assembly integral therewith, said assembly comprising first and second interlocking parts, said parts each including a jaw, said jaws being opposed, a tongue spaced from and substantially parallel with each of said jaws to provide with said jaws a pair of cavities into which the opposing jaws may extend, said jaws interlocking by way of a set of triangularly prismoidal teeth on each jaw wherein as viewed in diametrical cross-section the vertex edges of the teeth of one jaw converge from the outer ends of such vertex-edges toward an exterior apical midpoint and the vertex-edges of the teeth of the other jaw converge to an interior apical midpoint, the said band having an inner surface with a longitudinal centreline of smaller diameter when tightened on a hose than the outer edges parallel therewith, and having said inner surface of said band in substantially diametrical cross-section of shallow conical configuration with the vertex projecting.

3,925,852

BAG CLOSURE DEVICE

Rolland E. Wood, R.R. No. 4, Greensburg, Ind. 47240

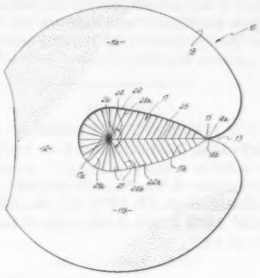
Filed Oct. 21, 1974, Ser. No. 516,445
Int. Cl.² B26B *19/00, 13/00*
U.S. Cl. 24—30.5 R **3 Claims**

1. A generally plate like bag closure device comprising

an interior mouth section adapted to hold the neck of a bag in closure relationship within said mouth section, said mouth section being defined by oppositely disposed jaws interconnected by a shoulder portion, and said mouth section comprising a closure area and a latching area, each area being provided with a plurality of flexible teeth that are substantially touching along adjacent side edges when said teeth are not engaged with a bag, and

structure defining an entry throat through which a bag neck may be disposed within said mouth section from the exterior of said bag closure device,

said teeth within said mouth's closure area being each of a generally wedge shaped geometry which extend from the center point of said mouth section to the periphery of said mouth section, and said teeth within said mouth's latching



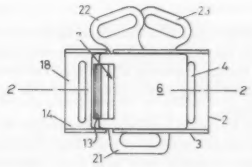
area being angled inwardly toward the center of said mouth section away from said entry throat.

3,925,853

BELT COUPLINGS

John Mills Nicklin, Auckland, New Zealand, assignor to John Edward Butler (New Zealand) Ltd., Auckland, New Zealand

Filed Nov. 18, 1974, Ser. No. 524,872
Int. Cl.² A62B *35/60;* **A44B** *17/00*
U.S. Cl. 24—75 **4 Claims**



1. A belt coupling comprising:

a. a latching member, said latching member including (i) a latch plate of a predetermined thickness having an aperture therein, (ii) a movable slide of a predetermined thickness adapted to slide on said latch plate, said slide having an aperture therein adapted to correspond to the aperture in said latch plate in a first position of said slide, (iii) means for biasing said slide to a second position wherein a portion of said slide overlaps the aperture in said latch plate while not completely covering the latch plate aperture, said biasing means allowing movement of said slide from said second position to said first position thereof, (iv) means for moving said slide against the bias of said biasing means,

b. means formed with said latch member for connecting said latching member to a belt,

c. a tongue member, said tongue member including (i) a tongue plate, (ii) a tongue integral with said tongue plate and having a portion thereof extending generally normal to said tongue plate from a line of connection therewith, and having an end thereof remote from said tongue plate, (iii) a lip formed integral with the end of said tongue remote from said tongue plate, said lip having a portion thereof extending generally parallel to said tongue plate in a direction away from said line of connection of said tongue with said tongue plate, and said lip portion being spaced from said tongue plate a predetermined distance generally at least as great as the thickness of said latch plate plus the thickness of said slide, and

d. means formed with said tongue member for connecting said tongue part to a belt, whereby said tongue may be

inserted through said apertures in said latch plate and said slide when said slide is in the first position thereof, and after return of said slide under the influence of said biasing means to the second position thereof said lip portion will engage a surface of said slide remote from said latch plate to thereby latch said latching member and said tongue member together.

3,925,854

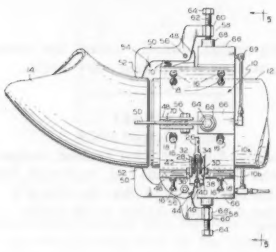
ALIGNMENT CLAMP

James D. McFadden, 2300 Jefferson Ave., Anchorage, Alaska 99503

Continuation-in-part of Ser. No. 404,491, Oct. 9, 1973. This application Sept. 23, 1974, Ser. No. 508,673

Int. Cl.[2] A44B *21/00*; B25B *1/20*; F16L *13/02*

U.S. Cl. 24—81 PE **17 Claims**



12. A device for holding two structural shapes in alignment for welding one to the other, such device comprising:

an outer band for surrounding a first said structural shape, said outer band being removably securable to said first structural shape,

said outer band having a configuration similar to the exterior cross sectional outline of said first structural shape, movable dogs mounted from said band and having forward ends for engaging a second of said structural shapes, said dogs extending outwardly of the region of the joint between the two structural shapes to permit welding between the structural shapes,

and operating means interengageable between said outer band and said movable dogs for bringing about the movement of the forward ends of said dogs toward the second of said structural shapes in supporting relation to the second of said structural shapes.

3,925,855

BUTTON RETAINER

Gudmar Olovson, 23, rue de la Ronce, 92 Ville D'Avray, Frankrike, Sweden

Continuation of Ser. No. 375,473, July 2, 1973. This application Feb. 10, 1975, Ser. No. 548,621

Int. Cl.[2] A44B *1/26*

U.S. Cl. 24—90 PR **1 Claim**

1. A button assembly adapted to secure a button to a fabric material comprising:

a. a button member for abutting one side of the fabric;

b. a fabric piercing member integrally formed with the button member and extending from said button member;

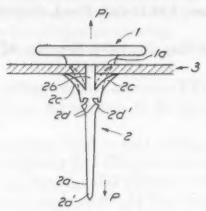
c. said fabric piercing member comprising:

i. a relatively rigid portion having a free and pointed end for piercing the fabric;

ii. a relatively resilient portion between the button member and said rigid portion;

iii. said rigid portion being recessed to form a frangible web connecting with said resilient portion to facilitate the breaking off of the rigid portion upon completion of the fabric piercing operation;

iv. a plurality of flexible barbs extending obliquely from said relatively resilient postion towards said button member, the free ends of said flexible barbs which face the button member being a spaced distance from the button member which is less than the thickness of the fabric, said barbs being adapted to flex towards each other during the fabric piercing operation and to flex away from each other to abut against the opposite side of the fabric when the resilient portion is seated in the fabric to thereby anchor the button in the fabric;



d. said button member comprising a widened head portion and a narrow shank portion resting against the fabric and spacing the head from the fabric, said shank portion being dimensioned to form a backing surface for fabric being pressed thereagainst by the barbs;

e. the rigidity of said rigid portion increasing progressively in stiffness from its point of connection to said web toward its point.

3,925,856

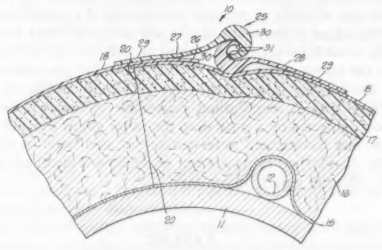
SELF LOCKING SEAM FORMING MEMBERS

Walter A. Plummer, III, Tempe, Ariz., assignor to Walter A. Plummer, Sherman Oaks, Calif.

Filed Nov. 29, 1972, Ser. No. 310,257

Int. Cl.[2] A44B *17/00*

U.S. Cl. 24—201 C **1 Claim**



1. A pair of continuous inter-engaging seam-forming members extruded from plastic material, said seam-forming members being of the same J-shape in cross section and each including a stem portion integral with one edge of a crescent shaped trough portion, the trough portions of said seam forming members being interlockable when overlapped with their open sides facing toward one another, the free lip edge of each trough shaped portion being engageable with the interior surface of the trough portion of the other seam forming member generally in the plane of the stem portion thereof, said stem portion being relatively wide thin and flexible, said trough shaped portion having a relatively non-flexible mid-portion several times thicker than said stem portion and with the opposed sidewalls of said trough shaped portion converging from said thick mid-portion to provide a relatively thin entrance lip edge and the other sidewalls tapering into a merger with said relatively thin stem portion, and the stem

portions of said seam forming members lying generally in a common plane passing between said free lip edges of said trough shaped portions when said seam forming members are assembled and under tension load crosswise of the seam.

3,925,857

SLIDER FOR A SLIDE FASTENER

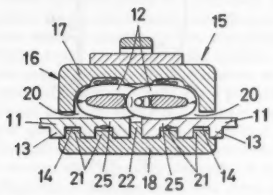
Toshiyuki Kihara, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1974, Ser. No. 495,584

Claims priority, application Japan, Sept. 17, 1973, 48-109086[U]

Int. Cl.² A44B 19/26

U.S. Cl. 24—205.15 R 4 Claims



1. In a slide fastener having a pair of stringer tapes, rows of interlockable fastener elements each connected to a corresponding stringer tape, and a slider having guide channels therethrough for receiving said rows of fastener elements and respective adjoining portions of said stringer tapes, said slider being moveable along said rows of fastener elements and stringer tape portions to selectively couple and uncouple the fastener elements, the improvement which comprises a plurality of alternate ridges and grooves in each of said stringer tapes; and at least a pair of guide ridges disposed within said slider to extend along respective guide channels thereof, said guide ridges being positioned for sliding contact with corresponding grooves of the stringer tapes to maintain a given spacing of said tapes and fastener element rows assuring correct coupling and uncoupling of said rows of fastener elements as the slider is moved therealong.

3,925,858

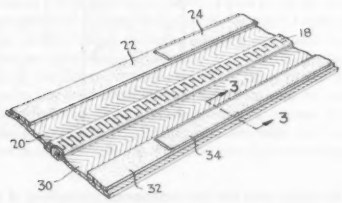
ADHESIVELY SECURABLE SLIDE FASTENER

Bruce K. Thaeler, Meadville, Pa., assignor to Textron Inc., Providence, R.I.

Filed June 26, 1973, Ser. No. 373,715

Int. Cl.² A44B 19/34

U.S. Cl. 24—205.16 D 6 Claims



1. A slide fastener installation, the combination comprising a pair of carrier tapes having outer edges and having inner edges adjacent each other,

a plurality of interlocking elements on each inner edge and being adapted for movement by a slider member which causes opening and closing of interlocking elements on one edge relative to the interlocking elements on the other edge,

a layer of heat bondable adhesive on each of said tapes,

a layer of water soluble, liquid activated adhesive on each of said layers of heat bondable adhesive whereby said slide fastener can be temporarily held in place on an article by moistening the layers of liquid activated adhesive on said tapes prior to permanent installation as by heating the heat bondable adhesive.

3,925,859

CONTINUOUS COUPLING ELEMENT FOR SLIDE FASTENERS

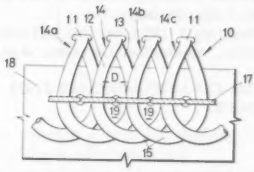
Kiichi Yoshikawa, Toyonaka, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 9, 1974, Ser. No. 496,195

Claims priority, application Japan, Sept. 21, 1973, 48-111093

Int. Cl.² A44B 19/12

U.S. Cl. 24—205.16 C 2 Claims



1. In a slide fastener having a continuous coupling element attached to a stringer tape by stitches extending along a line of stitching the improvement which comprises a coupling element in the form of a substantially helically wound filament with the turns thereof forming a plurality of spaced apart coupling heads along one longitudinal side of said filament for mating engagement with identical coupling heads of a complementary coupling element, each of said turns of said filament having first and second shanks which are curved arcuately in opposite directions, so as to protrude from the central axis of the turn toward the adjacent turns over a maximum distance equal to substantially one-half of the pitch of said turns of said filament, said first shank of one exemplary turn being disposed in partially overlapping relationship to the second shank of the turn immediately adjoining said exemplary turn on one side thereof and being connected via a bight to the second shank of the turn immediately adjoining said exemplary turn on the other side thereof, the last mentioned second shank partially underlying the first shank of the turn two pitches away from said exemplary turn on said other side thereof, said continuous coupling element being stitched against one surface of the stringer tape, and said first shanks of said turns of said filament overlapping said second shanks of the adjoining turns along said line of stitching.

3,925,860

SNAP BUTTON

Toshitsugu Furuya, Hyogo, Japan, assignor to Furuya Kogyo Kabushiki Gaisha, Japan

Filed July 18, 1974, Ser. No. 489,513

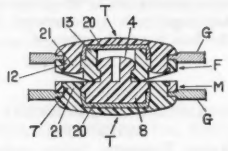
Claims priority, application Japan, July 21, 1973, 48-81571; Nov. 16, 1973, 48-129389

Int. Cl.² A44B 17/00

U.S. Cl. 24—208 A 15 Claims

1. A snap button comprising a male member and a tacking member, said male member comprising a base formed with uniformly space holes positioned at equal distances from the center of said base, a projection, and a raised portion having a polygonal cross section, the polygon having a predetermined positional relationship with respect to said holes, said raised portion including at least one segment formed over a central

area of said base, said raised portion serving to restrict the orientation of the male member, said tacking member having



uniformly spaced pointed legs at equal distances from the center of the member and adapted to be aligned to said holes.

3,925,861
UPHOLSTERY FASTENING DEVICE

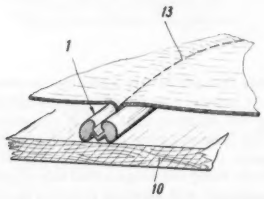
Alfred Tillner, Belm, Germany, assignor to Oke Rainer von der Heyde & Co., Lotte, Germany

Filed July 3, 1974, Ser. No. 485,482

Claims priority, application Germany, Apr. 26, 1974, 2420331

Int. Cl.² A47C *3/00*; A44B *21/00*

U.S. Cl. 24—243 K **11 Claims**



5. A fastening device for use in attaching fabric to the surface of a foundation comprising: a flexible, one-piece extrusion made of plastic material, said extrusion having a cross-sectional configuration in the general shape of an I, said extrusion thereby having two spaced-apart ribs and a central web joining said ribs, said web being spaced from said foundation surface when said two spaced-apart ribs are in contact with said foundation surface, said web being constructed and arranged such that securing means may be driven through said web into said foundation surface to thereby bend said web into a V-shaped configuration, whereby, upon laying said extrusion on said foundation surface, covering said extrusion with said fabric, and driving said securing means through said fabric and through said web into said foundation surface as aforesaid, said web is bent into said V-shaped configuration and the portions of said ribs remote from said foundation surface are brought together to trap said fabric between said ribs and within said V.

3,925,862
QUICK CLOSING CLAMP

Hugh A. Youngblood, Jr., 3225 N. Virginia, Oklahoma City, Okla. 73118

Filed Nov. 7, 1974, Ser. No. 521,582

Int. Cl.² A44B *21/00*; F16M *13/02*

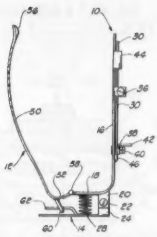
U.S. Cl. 24—252 R **11 Claims**

1. A quick closing, automatically actuated clamp comprising:

a base;

a generally L-shaped slotted jaw pivotally mounted on the base for pivotation about a horizontal pivotal axis, said jaw including a foot plate terminating in an edge spaced from said horizontal pivotal axis and another plate extending substantially normal to said foot plate and having a slot therein;

a generally L-shaped male jaw having a base portion pivotally connected to said plate at said edge for pivotation about a pivotal axis spaced from, and extending substantially parallel to, said first-mentioned pivotal axis, said second pivotal axis moving toward and away from said base as said jaws are respectively pivoted toward and away from each other, said male jaw further including a clamping portion dimensioned to fit into the slot in said slotted jaw;



means resiliently biasing said jaws apart from each other to a location where said second-mentioned pivotal axis is located at its furthest distance from said base;

means movably interconnecting said male jaw to said base for limiting the distance said male jaw can be pivoted away from said slotted jaw; and

a latching tongue movably mounted on said slotted jaw for engaging said male jaw when it is pivoted toward said slotted jaw, and said clamping portion enters the slot in said other plate of said slotted jaw.

3,925,863
APPARATUS FOR THE CONTINUOUS WRINKLING OF WEB SHAPED FLAT MATERIALS

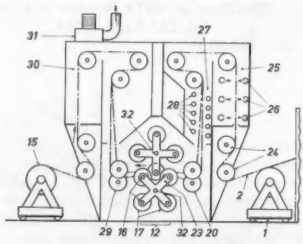
Arnfried Meyer, Neckargartacherstrasse, 7101 Frankenbach, Germany

Filed Dec. 14, 1971, Ser. No. 207,898

Claims priority, application Austria, Dec. 14, 1970, 11219/70

Int. Cl.² D06C *19/00*

U.S. Cl. 26—1 **16 Claims**



1. An apparatus for the continuous crumpling of a flexible, flat web to form random creases therein comprising: treatment means forming a treatment zone for continuously and alternately gathering said web simultaneously in its longitudinal and transverse directions, said treatment means comprising a plurality of guide elements for gathering said web in said zone, said guide elements arranged in succeeding rows in the feeding direction of said web, the guide elements in each row intermeshing with guide elements in adjacent rows in the direction of travel of the web through said zone, the web being

guided through said treating zone in a wavelike manner simultaneously in longitudinal and transverse directions, said treatment means further including drive means for rotating said guide elements for advancing said web through said treatment means; feeding means for continuously supplying said web in its flat, outstretched state to said treatment means; means for continuously removing said web from said treatmet means; and means for continuously stretching and spreading out said web to yield the flexible, flat web having random creases therein; said treatment means further comprising at least two parallel rotatable axles, a multi-pronged member disposed on each axle, shafts rotatably mounted on the prongs of each of said members and containing said guide elements thereon such that said guide elements are radially offset from said axles, and drive means for synchronously rotating said axles and hence said multi-pronged members in opposite directions whereby said guide elements mesh in a cogwheel manner.

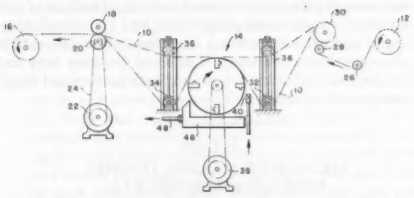
10. An apparatus for the continuous crumpling of a flexible, flat web to form random creases therein comprising at least two multi-pronged members mounted for rotation about respective parallel axes, a plurality of parallel shafts mounted on the prongs of said multi-pronged members, a plurality of guide elements mounted on each shaft, said multi-pronged members, shafts and guide elements mounted so that the guide elements on the shaft of one multi-pronged member intermesh in a cogwheel manner with the guide elements on the shafts of the other multipronged member, and first drive means for synchronously rotating said multi-pronged members.

3,925,864

LOOP PILE FABRIC CUTTING APPARATUS WITH SELVEDGE PROTECTOR

Michael William Gilpatrick, Chesnee, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 3, 1975, Ser. No. 554,739
Int. Cl.² D06C *13/08*
U.S. Cl. 26—9 **1 Claim**



1. Apparatus to provide a cut loop pile fabric product comprising: a rotor, a plurality of rows of cutting means in said rotor, means to rotate said rotor, each of said plurality of rows having a plurality of cutting modules therein and blank modules outside of the cutting modules on each end, each of said cutting modules comprising a plurality of upwardly projecting cutting blade members, a plurality of cutting blade guard members adjacent said cutting blade members and projecting upwardly beyond said cutting blade members, means to pass the loops of a loop pile fabric into contact with the cutting module and means to take up the loop pile fabric having cut loops.

3,925,865

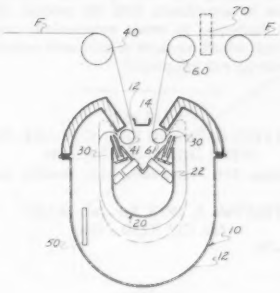
FABRIC BULKING UNIT

Donald K. Christian, 119 Woodbine Ter., Spartanburg, S.C. 29301

Filed Oct. 24, 1973, Ser. No. 409,180
Int. Cl.² D06C *1/00*
U.S. Cl. 26—18.5 **4 Claims**

1. Bulking apparatus for textile fabric comprising:

a. a treating vessel;
b. a pressure manifold received in said vessel and extending at least along the effective treating width thereof, said manifold having at least one upwardly oriented nozzle therein at a predetermined angle;
c. means to feed a textile fabric to the treating vessel;
d. means to withdraw the textile fabric from the treating vessel, the fabric passing in transit through the vessel between said feeding and withdrawing means over the



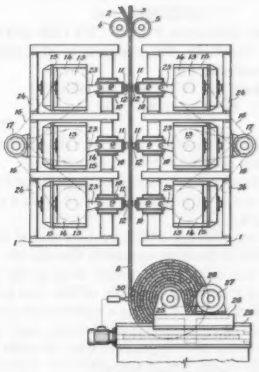
upwardly oriented nozzle and forming a downwardly extending loop therebetween; and
e. means adjacent the loop for sensing the extent thereof for controlling the rate of travel of the fabric through the vessel, the fabric being solely and freely supported on an upwardly directed air stream generated by the nozzle of the pressure manifold and bulked by actions induced therein by said air stream between the feeding and withdrawing means.

3,925,866

METHOD AND NEEDLE MACHINE FOR THE PRODUCTION OF PILE FABRICS

Herbert Lochner, Kempen, Germany, assignor to Cikalon-Vliesstoffwerk GmbH, Kempen, Germany

Filed Feb. 19, 1974, Ser. No. 443,719
Claims priority, application Germany, Feb. 21, 1973, 2308516
Int. Cl.² D04H *18/00*
U.S. Cl. 28—4 R **10 Claims**



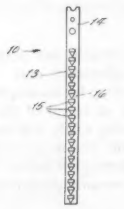
1. Needling apparatus for producing needled pile web from fibre web passed therethrough comprising, in combination, roller guide means for guiding said fibre web through said

apparatus in a direction extending vertically downwardly therefrom, a take-up drum disposed substantially directly below said roller guide means adapted to have said needled pile web wound thereabout in an accumulated web roll, at least one pair of directly opposed horizontally movable needle boards located between said roller guide means and said take-up drum and arranged to perform needling operations from opposite sides thereof upon fibre web passing therebetween in order to form pile layers thereupon, means for sensing the amount of web material accumulated upon said take-up roll, and means for moving said take-up roll in response to said sensing means in accordance with the amount of material accumulated thereupon to retain substantially constant the location through which portions of said web material incoming to said take-up roll are passed.

3,925,867
COMBINATION SAW AND FILING BLADE FOR USE WITH JIG OR SABRE SAW

James Kareman, 516 Monmouth Ave., Bradley Beach, N.J. 07720

Filed Feb. 4, 1975, Ser. No. 547,011
Int. Cl.² B23D 71/00
U.S. Cl. 29—78 3 Claims



1. In a combination Saw and Filing Blade for use with a Jig or Sabre Saw, the combination of a bar made of suitable hard steel; said bar having flat opposite sides; one end of said bar being adaptable for being held in a chuck of a portable electrically powered Jig or Sabre Saw, and a longitudinal row of teeth formed on each of said flat sides, having means for sawing and filing at the same time; each said tooth including a flat rectangular face having three cutting edges, and a body of said tooth tapering from said face to a point.

3,925,868
CLAMPING ASSEMBLY FOR CUTTER BITS

Kanwar J. Singh, Meadville, Pa., assignor to McCrosky Tool Corporation, Meadville, Pa.

Filed June 21, 1974, Ser. No. 481,781
Int. Cl.² B26D 1/00
U.S. Cl. 29—96 8 Claims

1. A tool clamping assembly for detachably fastening an indexable cutting bit on a tool holder, comprising

a. a tool holder having a recessed seat therein for receiving a regular polygonal cutting bit provided with a plurality of cutting edges,

b. said recessed seat having a base portion and at least one shoulder portion extending upwardly therefrom,

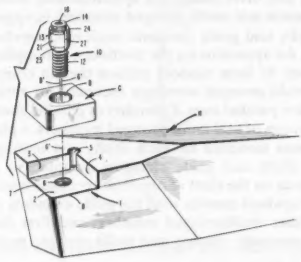
c. said base portion having a threaded bore at the interior portion thereof extending inwardly of the tool holder,

d. said indexable cutting bit having a cylindrical opening of larger diameter than said threaded bore, said opening extending between the opposite faces of said bit and centrally of the lateral edges thereof,

e. a clamping bolt for fastening said cutting bit onto said seat, said bolt having a threaded portion at the one end thereof and an external tapered lateral surface at the opposite end thereof,

f. a radially expansible sleeve surrounding said tapered lateral surface of said bolt provided with a narrow slot in the lateral wall thereof extending from the opposite ends thereof,

g. said sleeve having an external substantially cylindrical surface normally fitting closely within said cylindrical opening of said cutting bit, and an internal frusto-conical surface having a conicity corresponding to the tapered lateral surface of said bolt to effect substantially complete surface contact between said internal frusto-conical surface and the tapered lateral surface of said bolt around its entire circumferential area except for the small area adjacent to said narrow slot, and

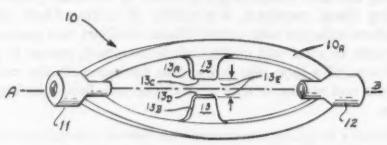


h. means at the end of said bolt for imparting rotary movement thereto, whereby the advancing movement of the threaded portion of said bolt into said threaded bore of said tool holder imparts only radial expansive movement to said sleeve to the exclusion of any translational movement thereto, which effects tightly engaging contact between substantially the entire periphery of said tapered lateral surface of said bolt and the correspondingly tapered internal surface of said sleeve as well as between substantially the entire external cylindrical surface of said sleeve and the internal periphery of said cylindrical opening in said indexable cutting bit, whereby a rigid and tight clamping interconnection is effected between said tool holder and cutting bit at both said base portion and shoulder portion of said seat.

3,925,869
METHOD OF MAKING TENSION INDICATOR-TURNBUCKLE

Fredrick W. Thompson, Downey, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 431,197, Jan. 7, 1974, abandoned. This application Mar. 11, 1975, Ser. No. 557,419
Int. Cl.² B23P 13/00
U.S. Cl. 29—175 1 Claim



1. The method of manufacturing a tension indicator-turnbuckle, comprising the steps of:

a. forming, from elastic material, a body of preselected shape and having an axis, wherein said preselected shape includes a first end and a second end in axially aligned spaced-apart relationship along said axis, and further wherein said preselected shape also includes a middle

portion between said axially aligned first end and second end;

b. threading said first end and said second end internally;

c. applying simultaneously a preselected tension load to said first end, and an equal and directionally opposite tension load to said second end, whereby said formed elastic body temporarily deforms;

d. forming a slit in said middle portion of said temporarily deformed elastic body;

e. and, discontinuing the application of said preselected tension load to said first end and of said preselected oppositely directed equal tension load to said second end; whereby the temporarily deformed elastic body returns to its original preselected shape, and whereby said slit formed in said middle portion of said temporarily deformed elastic body becomes a gap, and also whereby the complete closing of the gap resulting from the subsequent application of tension loads to said first end and said second end of said elastic body is a visual indication that the applied tension loads are equal to the preselected loads which were originally applied to said first and second ends to temporarily deform the said formed elastic body.

3,925,870

TRUSS ASSEMBLY JIG

James D. Adams, P. O. Box 7462, Colorado Springs, Colo. 80933

Filed Jan. 21, 1974, Ser. No. 435,201
Int. Cl.² B23P *19/00*
U.S. Cl. 29—200 J **10 Claims**

1. A truss assembly jig for forming at least one structural truss by joining a plurality of individual precut wooden members, the truss joints being made by compressing and embedding toothed gusset plates on each side of the joints of the individual members, the jig comprising:

a. base means;

b. movable support means mounted on said base means and having a flat elongated surface for supporting the precut members arranged into the shape of at least one structural truss;

c. a plurality of clamping means mounted on said support means and arranged around the outside of the perimeter of a held truss to hold the assembled members in truss position, said clamping means including means for elevating the held truss members above the surface of the support means to permit the positioning of the gusset plates on each side of the joints of the held individual precut members;

d. first roller means mounted on said base means and having a pair of spaced apart, opposed substantially vertical rollers arranged with their bite horizontally aligned with said support means for passing said support means therethrough, one of said rollers being disposed beneath said surface, aid rollers being arranged to receive said movable support means and at least one truss thereon, so as to partially embed the gusset plates into said precut members passing between said roller means, said first roller means further including means following said roller means to sequentially release each clamping means after it passes through said roller means to free the truss;

e. a second roller means mounted on said base means and having a pair of spaced apart, opposed substantially vertical rollers horizontally aligned with said first roller means and arranged to pass at least one truss therethrough after it passes said first roller means so that said gusset plates are fully compressed and embedded into said precut members to form said structural truss; and

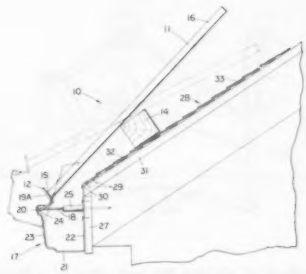
f. said movable support means includes power drive means drivingly connected to said support means and said first and second roller means, whereby said movable support means is moved toward said first roller means at a lineal speed which is equivalent to the rotative speed of said first and second roller means.

3,925,871

HAND TOOL

Peter W. Beaumont, 6806 1st Ave. N., Birmingham, Ala. 35206

Filed Jan. 6, 1975, Ser. No. 538,606
Int. Cl.² B23P *19/04*
U.S. Cl. 29—239 **3 Claims**



1. A hand tool for use in the removal of guttering from buildings and the like comprising:

a. an angle iron member, said angle iron member being sized appropriately to allow the distal edge of said angle iron member to engage the lip portion of a gutter;

b. an elongated handle member attached to said angle iron member, the long dimension of said handle member being mounted at substantially right angles to the long dimension of said angle iron member; and

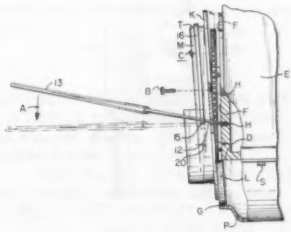
c. gripping members mounted on both ends of said angle iron members, said gripping members being mounted in such a manner that when said angle iron member has engaged said lip portion of said gutter said gripping members can be locked onto said gutter to prevent slipping or buckling of said gutter during removal.

3,925,872

TIMING COVER REPLACEMENT TOOL

Lloyd B. McDaniel, 927 W. Larissa St., Jacksonville, Tex. 75766

Filed Oct. 4, 1974, Ser. No. 512,761
Int. Cl.² B25B *27/14*
U.S. Cl. 29—267 **2 Claims**



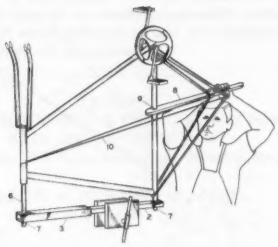
1. A tool comprising a handle portion, a working portion comprising a bar attached to said handle portion and having spaced prongs extending from the bar away from the handle portion, and a band portion comprising a U-shaped band having free ends with openings therethrough extending normal to the plane of the band and sized and spaced to pass said

prongs, and said working portion and said band portion being cooperatively assembled with said prongs extending through the openings in said free ends.

3,925,873
BICYCLE FRAME ALIGNMENT APPARATUS

Robert C. Mecum, 5728 Monona Drive, Madison, Wis. 53716

Filed Feb. 3, 1975, Ser. No. 546,193
Int. Cl.² B25B 27/14
U.S. Cl. 29—271 2 Claims



1. A method of aligning the rear stays of a bicycle frame having a head tube, a seat tube, rear stays, and rear dropouts, said method comprising:

a. placing the head and seat tubes of a bicycle frame over stationary head and seat tube spindles,

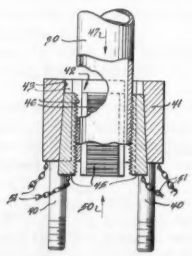
b. attaching an elastic band from the rear dropouts forward around the head tube of the bicycle frame, and

c. placing a stay aligning tool against either side of the head tube of the bicycle frame and levering the rear stays of the bicycle frame into a position to equalize the distance from the elastic band to the seat tube on each side while maintaining the desired rear wheel hub distance between the rear dropouts.

3,925,874
PIPE GRIPPER

Steven M. Moyers, Omaha, Nebr., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 9, 1974, Ser. No. 486,924
Int. Cl.² B23P 19/02
U.S. Cl. 29—282 2 Claims



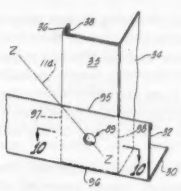
1. A tool for gripping the exterior surface of a pipe to enable an axial force to be transmitted to the pipe, comprising:

a wedge-seating member having a first side and a second side opposite said first side, said wedge-seating member having a hole in the shape of a cruciform extending therethrough from said first side to said second side capable of receiving said pipe, said hole having a longitudinal axis with each end interior surface of the branches of said cruciform hole forming axial seating surfaces positioned symmetrically about said longitudinal axis in substantially circular alignment, said wedge-seating member having coupling bolts extending from said first side axial to said longitudinal axis, a pulling machine coupled to said coupling bolts for applying force thereto axial to said longitudinal axis, each of said seating surfaces being equally tapered with respect to said longitudinal axis in the same direction from said first side toward said second side, and a plurality of wedges each having two ends, a seating face and a grooved concave face opposing said seating face, each of said seating faces being tapered from one end of said wedges to the other with the same degree of taper as said seating surfaces so that with a pipe inserted into said hole, and each of said seating faces in sliding contact with one of said seating surfaces, said concave faces are maintained in substantially circular alignment about said longitudinal axis, and whereby force applied by said pulling machine to said coupling bolts in a first direction from said first side to said second side causes axial sliding of said seating faces across said seating surfaces, thereby decreasing the diameter of said circular alignment and tending to grip the pipe, the decrease in diameter of said circular alignment being limited by the abutting of adjacent concave faces, and force applied to said wedge-seating member opposite in direction to said first direction thereby causes axial sliding of said seating faces across said seating surfaces in the direction from said second side to said first side increasing the diameter of said circular alignment tending to release the pipe.

3,925,875
METHOD OF CONSTRUCTING A PREFABRICATED WALL MODULE

Jack Doke, Diamond Bar, Calif., assignor to Angeles Metal Trim Co., Los Angeles, Calif.

Continuation of Ser. No. 364,295, May 29, 1973, abandoned.
This application July 8, 1974, Ser. No. 486,629
Int. Cl.² B21D 39/00; B23P 11/00
U.S. Cl. 29—509 4 Claims



3. A method of constructing a prefabricated wall module for a building, wherein the wall module comprises:

a first normally horizontal sheet metal member in the form of an upper U-shaped downwardly facing cap member having a main web and two longitudinal side flanges depending from the main web;

a second normally horizontal sheet metal member in the form of a lower U-shaped floor track member having a main web and two longitudinal side flanges extending upward therefrom;

a plurality of horizontally spaced normally upright sheet metal studs, each having a main longitudinal web and two opposite side flanges extending from the main web,

the upper and lower ends of the studs being telescoped into the first and second horizontal members respectively into pressure contact with the main webs thereof with the two side flanges of each longitudinal member in face-to-face relation with the side flanges of the studs thereby providing a pair of opposite rectangular areas of two layers of overlapping sheet metal at each end of each stud,

the intersection of the side flanges of the studs with the side flanges of the two horizontal members forming 90° angles with the vertex of each angle at a corner of one of said rectangular areas;

said method being characterized by the use of a tool having two parts with the reach of the jaws thereof at least equal to the distance from said vertex to a central portion of the corresponding rectangular area,

the two parts of the tool respectively carrying two cooperating punching elements, one being a hollow die, and the other being a punch;

said method including the steps of:

placing each stud in the desired assembled position relative to said horizontal members thereby providing two of said rectangular areas at each end of the stud with one of said vertices at the corner of the rectangular area;

applying pressure to said track member and said cap member to force the webs of said members into pressure contact with the ends of said studs;

placing said tool in the region of each of said vertices with the parts extending diagonally of the corresponding rectangular area into a central portion of the rectangular area and with said two punching elements on opposite sides of the overlapping portions of said sheet metal in said area;

and forcing said jaws together to drive said punch through the two layers of metal of the rectangular area into the interior of the die,

while the ends of said studs are held in pressure contact with the webs of said longitudinal members,

said punch and die being shaped and dimensioned to form an aperture in the two layers with interlocking tongues of the two layers projecting from the periphery of the aperture into the interior of the stud and with the tongues more nearly perpendicular to than parallel to the inner surface of the stud.

3,925,876

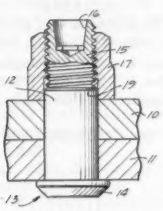
METHOD OF JOINING BOLTS OR RIVETS TO NUTS

Donald A. Curtis, Ashville, N.Y., assignor to TRW Inc., Cleveland, Ohio

Filed Mar. 26, 1974, Ser. No. 454,856

Int. Cl.² B21D *39/00*; B23P *11/00*

U.S. Cl. 29—509 **3 Claims**



1. The method of fastening together a plurality of members having aligned coaxial apertures which comprises providing a headed pin having a threaded shank portion with a polygonal recess formed therein, seating the head of the pin against one surface of the members to be fastened together, the pin being of sufficient length so that the threaded shank portion extends through said apertures and beyond the opposite surface of the members to be fastened together, threading a nut onto said threaded shank portion with sufficient torque to develop a preloading stress in said pin, and thereafter inserting a heating element into said polygonal recess to thereby cause radially outward plastic deformation of the threaded shank portion from which results increased tension in said pin.

3,925,877

APPARATUS FOR CHANGING THE TOOL HOLDERS CARRYING MOUNTED TOOLS ON A MACHINE TOOL

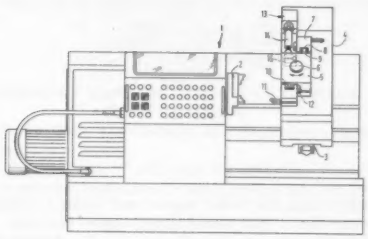
Wilhelm August Karl Junike, and Hans-Joachim Koch, both of Hannover, Germany, assignors to Max Muller Brinker Maschinenfabrik Zweigniederlassung der Gildemeister Aktiengesellschaft, Langenhagen, Germany

Filed Apr. 11, 1974, Ser. No. 460,177

Claims priority, application Germany, Apr. 13, 1973, 2318778

Int. Cl.² B23Q *3/155*

U.S. Cl. 29—568 **6 Claims**



1. Apparatus for changing tool holders carrying tools used on a lathe having a main frame, a bed slide longitudinally slidable on said main frame, a face slide slidably mounted on said bed slide for transverse movement with respect thereto and inclined to the horizontal said apparatus including in combination:

a tool turret rotatably supported by said face slide and having at least two tool holder clamping devices,

at least one movable tool holder magazine supported by said main frame for slidable movement in the same direction as said bed slide and positioned generally above said face slide and above the turret,

said magazine having a series of arbors, each carrying a tool holder, and having means for indexing said arbors around a closed loop having a straight portion lying in a plane perpendicular to the longitudinal displacement direction of said bed slide and being at least as long as the displacemnt range of the turret in the displacement direction of said face slide, and arranged generally above and directly opposite said-mentioned displacement range of said turret,

said magazine itself being displaceable only in the displacement direction of said bed slide, and

said indexing movement of said arbors and their tool holders on said magazine lying parallel to the displacement direction of said face slide,

tool holder transfer means supported by said face slide for transferring tool holders between said magazine and said turret.

3,925,878

GRINDING MACHINE WITH AN AUTOMATIC EXCHANGE DEVICE FOR GRINDING WHEELS

Makoto Kikuchi, Kariya, Japan, assignor to Toyoda-Koki Kabushiki-Kaisha, Kariya, Japan

Filed May 17, 1974, Ser. No. 470,936

Claims priority, application Japan, May 17, 1973, 48-54935; May 17, 1973, 48-54937

Int. Cl.² B23Q *3/157*

U.S. Cl. 29—568 **12 Claims**

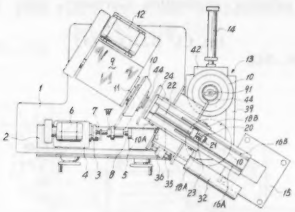
1. A grinding machine comprising:

a wheel head,

a wheel spindle rotatably mounted upon said wheel head and having a wheel support end for supporting one of a plurality of wheel holders respectively fixing grinding

wheels, each wheel holder having means defining a bore which is engageable with said wheel support end;

a storage device provided with a plurality of stub shafts each of which includes a holder support end for supporting one of said wheel holders as a result of the engagement between said means defining said bore and said holder



support end, said holder support end having a configuration similar to that of said wheel support end; and

an exchange device for transferring one of said wheel holders from said storage device to said wheel head in order to attach said one of said wheel holders to said wheel spindle through the engagement between said bore and said wheel support end.

3,925,879

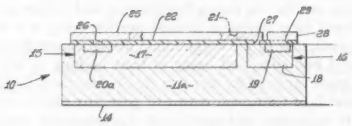
PROCESS OF FABRICATING PHOTOSENSITIVE DARLINGTON DEVICE

Harold Weinstein, Sherman Oaks, Calif., assignor to Sensor Technology, Inc., Chatsworth, Calif.

Filed Sept. 11, 1974, Ser. No. 505,036

Int. Cl.² H01C *7/08*

U.S. Cl. 29—572 **6 Claims**



1. A process for fabricating a Darlington photodetector device having light response characteristics within a specified narrow range, comprising;

forming in a semiconductor substrate a relatively large base region for a phototransistor and a base region for a second transistor, and forming emitter regions in the respective base regions,

producing an insulating layer over both said transistors, said layer having openings to both the emitter of said phototransistor and to the base of the second transistor,

depositing an optically opaque metalization layer over a substantial portion of the base of said phototransistor and over the openings to said emitter and the second transistor base so as to electrically interconnect the same,

providing an initial light-admitting opening of controlled area through said opaque metalization for passage of light to said phototransistor base region, the area of said initial opening being of such a size that the desired output current is not obtained,

measuring the device output current while said device is illuminated with light of known level, and

modifying the size of said opening to achieve an output current within the specified narrow range.

3,925,880

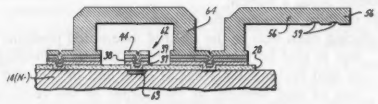
SEMICONDUCTOR ASSEMBLY WITH BEAM LEAD CONSTRUCTION AND METHOD

Warren C. Rosvold, Sunnyvale, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 138,497, April 29, 1971, abandoned. This application June 18, 1973, Ser. No. 371,054

Int. Cl.² B01J *17/00*

U.S. Cl. 29—578 **8 Claims**



1. In a method for fabricating a semiconductor assembly having beam leads, providing a semiconductor body having a planar surface, forming a plurality of semiconductor devices in said body with each of the semiconductor devices having at least one junction extending to said surface and defining a region in said body and having a contact area generally on said surface, forming a layer of insulating material on said surface, forming openings in said layer of insulating material, forming contact pad means on said layer of insulating material extending through said openings for making contact with said contact areas, delineating a plurality of dice in said semiconductor body with each die having certain semiconductor devices therein, depositing a thick layer of photoresist in an initially solid form over said contact pads to a thickness in excess of approximately ½ mil, forming openings in said thick layer of photoresist in registration with said contact pad means, forming beam leads overlying said photoresist and extending through said openings to make electrical contact with said contact pad means and being physically secured thereto, said beam leads extending over the boundaries of said dice and overlying adjacent dice and with the beam leads of each die being insulated from the beam leads of adjacent dice, and removing the thick layer of photoresist so that the beam leads are cantilevered and have their lower surfaces spaced above the layer of insulating material a distance in excess of approximately ½ mil and separating the body to form separate and individual dice with the beam leads mounted thereon.

3,925,881

METHOD OF MAKING A FACE COMMUTATOR

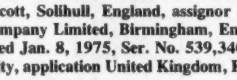
Roy Price Bowcott, Solihull, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Jan. 8, 1975, Ser. No. 539,340

Claims priority, application United Kingdom, Feb. 16, 1974, 7180/74

Int. Cl.² H01R *43/08*

U.S. Cl. 29—597 **2 Claims**



1. A method of manufacturing a face commutator, comprising starting with an annular blank of conductive material, forming in one face of the blank an annular channel so as to define upstanding circumferential flanges at the inner and outer peripheries of said one face of the blank, forming in said one face of the blank a plurality of equi-angularly spaced radially extending grooves, said grooves extending over the whole radial width of the blank and being deeper than the thickness of the blank so as to produce upstanding ribs on the opposite face of the blank, said grooves dividing the blank into a plurality of interconnected segments, performing a stamping operation on the outer peripheral flange portion of each seg-

ment to bifurcate the flange portion and deform the two limbs so produced away from one another to define a pair of circumferentially divergent projections at the radially outer end of each segment, moulding a synthetic resin body onto said one face of the blank, providing means on each segment whereby an electrical connection can be made thereto, and then removing said ribs from the other face of the blank to separate the segments.

3,925,882

COMPOSITE MATERIALS

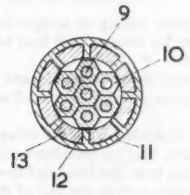
David John Sambrook, Warley, England, assignor to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

Division of Ser. No. 242,969, April 11, 1972, abandoned. This application Apr. 16, 1974, Ser. No. 461,353

Claims priority, application United Kingdom, Apr. 15, 1971, 9495/71

Int. Cl.² H01V *11/00*

U.S. Cl. 29—599 **6 Claims**



1. A method of manufacturing a metal composite material which comprises the steps of

a. assembling together a plurality of longitudinally-extending elements of a non-ferromagnetic metal having a low electrical resistivity,

b. separating each element from the other elements by a layer of a metal having a higher electrical resistivity,

c. forming a can including a plurality of substantially alternate segments of a low electrical resistivity metal and a metal of higher electrical resistivity,

d. locating the assembled elements in the can to form an assembly,

e. securing the assembly together, and

f. longitudinally extending the assembly to elongate the elements to produce corresponding filaments and to metallurgically bond the components of the assembly securely together.

3,925,883

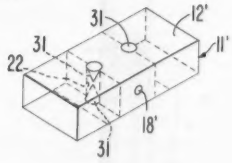
METHOD FOR MAKING WAVEGUIDE COMPONENTS

Charles T. Cavalear, Hamilton, Mass., assignor to Varian Associates, Palo Alto, Calif.

Filed Mar. 22, 1974, Ser. No. 453,742

Int. Cl.² H01P *11/00;* **B23K** *31/02*

U.S. Cl. 29—600 **8 Claims**



1. A method for making a microwave waveguide apparatus comprising the following steps:

bending a first metallic sheet into an open-sided rectangular channel member,

forming a second metallic sheet to provide a waveguide obstacle having outline dimensions fitting the inner transverse dimensions of said channel, said obstacle including an opening to define a waveguide iris, said forming of said second sheet including the step of bending at least one side of said sheet to form an angular foot projecting from said side,

positioning said obstacle within and transverse to said channel with said foot abutting a surface of said channel,

covering the open side of said channel with a third metallic sheet, and

sealing said channel, said obstacle and said third sheet together to form a tubular waveguide with said obstacle closing said waveguide except for said iris in said obstacle.

3,925,884

METHOD OF MANUFACTURING MULTI-TRACK MAGNETIC HEADS

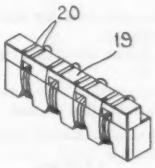
Derek Frank Case, 122 Cadbury Rd., Sunbury-on-Thames, England

Filed Dec. 7, 1973, Ser. No. 422,686

Claims priority, application United Kingdom, Dec. 29, 1972, 60100/72

Int. Cl. H01f *7/06*

U.S. Cl. 29—603 **6 Claims**



1. A method of manufacturing multi-track magnetic heads comprising the steps of:

providing a plate of magnetic material;

bonding a plate of non-magnetic material to said plate of magnetic material;

dividing the bonded plates into a plurality of elongate elements each element comprising a strip of magnetic material bonded to a non-magnetic strip;

turning each of said elements through 90° so that said magnetic strips are spaced from each other by said non-magnetic strips;

temporarily securing the elements in that position;

forming a plurality of parallel channels in a direction transverse to the length of said strips, each channel cutting through all said strips so as to form a window in each said magnetic strip;

separating the elements again;

winding around each said element a plurality of coils passing through respective ones of said windows;

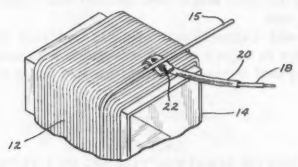
bonding said elements, with the coils wound on them, together in spaced parallel relationship with corresponding ones of said windows aligned in a direction transverse to the length of said elements, and with said magnetic strips spaced from each other by said non-magnetic strips; and dividing said elements along spaced parallel planes extending in said transverse direction, thereby to produce a plurality of substantially identical multi-track magnetic heads each containing a portion of each said element and each having one of said coils electromagnetically coupled to it.

3,925,885

METHOD FOR MAKING AND INSULATING A COIL TAP

Leonard S. Smith, Minneapolis, Minn., assignor to Century Mfg. Co., Inc., Minneapolis, Minn.

Filed Jan. 10, 1975, Ser. No. 540,283
Int. Cl.[2] H01F 7/06
U.S. Cl. 29—605 2 Claims

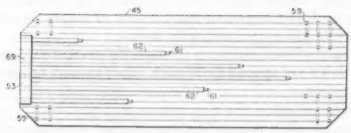


1. A method for tapping a coil and insulating the same, consisting of the steps of
stripping the end of a tap lead,
applying said stripped end of said tapped lead to a turn of the winding of a coil,
crimping said stripped end onto said turn forming a tap,
applying an insulating sleeve to said tap lead consisting of slitting one end portion of said sleeve forming a flap portion,
moving said sleeve onto said tap lead and placing said slit end adjacent said tap,
folding said flap portion about said tap insulating the same, and
overlying said flap portion with subsequent turns of said winding securing said flap portion.

3,925,886

NOVEL CATHODE FINGERS

Leo G. Evans, Tonawanda, and Walter W. Ruthel, Grand Island, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

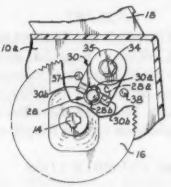
Division of Ser. No. 430,430, Jan. 3, 1974, Pat. No. 3,899,408.
This application Aug. 29, 1974, Ser. No. 501,715
Int. Cl.[2] H01R 43/02
U.S. Cl. 29—628 3 Claims

1. A method of electrically connecting at least one length of a highly conductive metal to a conductive metal cathode reinforcing means which substantially eliminates metal warpage from welding comprising the steps of:
a. welding a tip of conductive metal of the same type as the cathode reinforcing means to one end of said length of highly conductive metal and a bar of conductive metal of the same type as the cathode reinforcing means along the other end of said length of highly conductive metal,
b. correcting any metal warpage from welding dissimilar types of metals,
c. welding said tip and said bar to said cathode reinforcing means thereby electrically interconnecting said length of highly conductive metal and said cathode reinforcing means.

3,925,887

CAN OPENER WITH REMOVABLE HAND LEVER AND PIVOTAL LATCH

Robert E. McLean, Raytown, Mo., assignor to Rival Manufacturing Company, Kansas City, Mo.

Filed Mar. 21, 1974, Ser. No. 453,256
Int. Cl.[2] B67B 7/38
U.S. Cl. 30—4 R 5 Claims



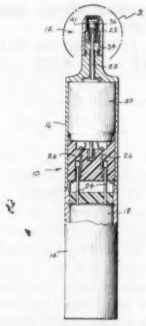
1. In a can opener having an upright frame, a rotary feed wheel, and means for rotating said feed wheel, the combination therewith of:
a hand lever carrying a cutting element thereon;
means defining an opening in one of said hand lever and said frame;
a pin member extending from the other of said hand lever and said frame, said pin member being axially insertable in said opening to mount said hand lever on said frame for pivotal movement about the axis of the pin member and said pin member being axially removable from said opening to detach said hand lever from said frame; and
a latch member supported on one of said hand lever and said frame for pivotal movement between a latching position wherein said pin member is engagingly retained in said opening by said latch member to preclude detachment of said hand lever from said frame and a release position wherein said pin member is axially removable from said opening to permit detachment of said hand lever from said frame, said pin member being selectively movable in said opening transversely thereof to engagingly pivot said latch member between said latching and release positions.

3,925,888

HAIR CLIPPER FOR THE NOSE AND EARS

William G. Bozsanyi, 2514 Hollywood Place, South Bend, Ind. 46614

Filed Sept. 30, 1974, Ser. No. 510,245
Int. Cl.[2] B26B 19/14
U.S. Cl. 30—29.5 5 Claims



1. In a hair clipper including a conically shaped hollow open ended head defined by a side wall, the side wall at said head

open end being serrated, a shaft extending into said head and terminating inwardly of the open end thereof, power means for rotating said shaft relative to said head, cutter blade means located within said head and having spaced cutters overlying the inner surface of said side wall at said head open end, means securing said blade means to said shaft for rotation with the shaft, the improvement comprising means located within said head between said spaced blade parts for deflecting hair protruding into said head open end toward said blade parts and between said serrations whereby said hairs will be caused to be severed by said blade parts, said deflecting means including a conically shaped portion having sides converging toward said head open end and being located oppositely of a blade part in alignment with such blade part and said head open end.

3,925,889

MECHANICAL HAIR FEEDING ELECTRIC RAZOR

Karmen D. Albert, 74-16 58th Ave., Elmhurst, N.Y. 11373

Filed Jan. 29, 1974, Ser. No. 437,705

Int. Cl.² B26B *19/12*

U.S. Cl. 30—43.8 **7 Claims**

1. In an electric shaver having a housing containing an electric motor, at least one cutting blade coupled to the output shaft of the motor for movement, and a shaving head with a comb in contact with the at least one cutting blade, the improvement comprising at least one eccentric member, of sufficient weight to move the shaver housing in an elliptical path with respect to the shaving area pivotably mounted in said housing, said eccentric member having an axis of rotation substantially parallel to the comb of the cutting head, and means for coupling said at least one eccentric member to the shaft of the motor so that the rotation of said eccentric member generates an unbalanced centrifugal force to cause the housing of the shaver to oscillate in a circular motion.

3,925,890

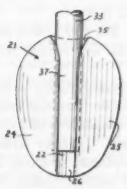
SPOON ATTACHMENT FOR SODA STRAW

Vaughn D. Frodsham, Fullerton, Calif., assignor to Howard E. Huntington, Fullerton, Calif.

Filed June 29, 1973, Ser. No. 375,085

Int. Cl.³ A47J *43/28*

U.S. Cl. 30—141 **1 Claim**



1. A spoon bowl attachment for cooperation with a soda straw comprising a substantially cylindrical wall defining a straw-receiving tunnel open along one side and enveloping a major portion of the straw section therein, spoon bowl wings extending away from the longitudinal axis of the tunnel and attached to the cylindrical wall, said tunnel diminishing in cross section toward the tip of the spoon bowl remote from the straw so as to grip a soda straw inserted therein, and an end wall of the tunnel tending to close the suction end of the tunnel.

3,925,891

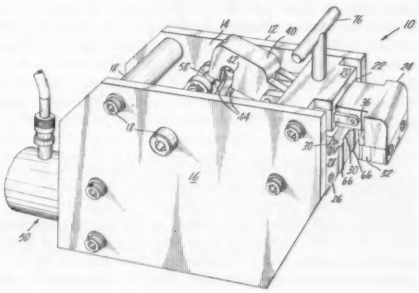
PUNCH MECHANISM FOR MODIFYING CIGARETTE MACHINE MAGAZINES

Roy J. Devilbiss, Richmond, Va., assignor to Philip Morris Inc., New York, N.Y.

Filed July 8, 1974, Ser. No. 486,301

Int. Cl.² B26F *1/00*

U.S. Cl. 30—362 **6 Claims**



1. Punching apparatus for removing segments of predetermined configuration from a sheet, said apparatus comprising an elongated frame,

a die element fixed to one end of said frame, said die element having a shear surface of predetermined configuration corresponding to the shape of the segment to be punched from the sheet,

an elongated carrier member having a punch fixed to one end thereof, said punch being complementally configured with said die element shear surface, said carrier member being supported on said frame for sliding straight line travel from a first position in which the punch at the said one end thereof is spaced outwardly a distance from the said one end of said frame to a second position in which the punch is spaced inwardly a distance from said one end of said frame, said punch when slid from said first to said second position passing through said die element adjacent said shear surface for applying punching force to a sheet positioned against said die element,

an elongated link pivotally connected at one of its ends to the other end of said carrier member, and

means for applying substantially straight line stroking force in the direction in which said carrier member slides when moving from its first to second position, the other end of said link being selectively connectable to said stroking means in force transmitting relationship therewith, said stroking means being effective to transmit a punching force through said link to said punch which is sufficient to shear a segment from said sheet,

the stroking means comprising a lever carrier in said frame and pivoted intermediate its ends for rotative movement about an axis extending substantially transversely of the travel course of said carrier member, the said other end of said link being selectively connectable to one end of said lever, biasing means engaged with the other end of said lever tending to rotate same about said axis in a predetermined direction, and a power operated ram operably engageable with the said other end of said lever for

rotating same about said axis in an opposite direction counter to the action of said biasing means whereby when said link is connected with said one end of said lever and said ram is operated, said carrier member is slid from its first to second position.

3,925,892

ARTIFICIAL TOOTH IMPLANT DEVICE

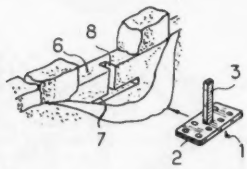
Jean-Marc G. Juillet, 102 rue de Courcelles, 75017 Paris, France

Filed Jan. 12, 1973, Ser. No. 323,239

Claims priority, application France, June 12, 1972, 72.21113

Int. Cl. A61c *13/00*

U.S. Cl. 32—10 A 12 Claims



1. An artificial tooth implant device engageable into a complemental artificial recess formed in the front or rear face of a jawbone for permanent retention of said device in said jawbone, said device comprising an implanting portion defined by a flat anchoring plate structure having at least one opening therein, and a mounting portion defined by an elongated post structure extending from a substantially central surface area of one face of said plate structure in a direction substantially perpendicular to said one face, and said post structure including means for mounting an artificial tooth or tooth structure on a free end length portion of said post structure.

3,925,893

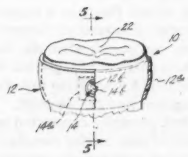
ORTHODONTIC ANCHORAGE

Roland M. Anderson, Lake Oswego, Oreg., assignor to Modcom, Inc., Canby, Oreg.

Filed July 11, 1974, Ser. No. 487,387

Int. Cl.² A61C *7/00*

U.S. Cl. 32—14 A 2 Claims



1. Orthodontic anchorage apparatus adapted for mounting on the crown of a tooth comprising

an endless, mouth-acid-resistant, elastomeric band elastically stretchable over and removably securable to such a crown for tight fitment thereon, said band when so fitted being in tension and contouring itself for substantially complete complementary embracement of the confronting surface of the crown,

means defining an opening in said band, and

an orthodontic attachment enabling the connection thereto of external orthodontic equipment, said attachment including a connecting portion insertable through said opening from the inside to the outside of said band so that the connecting portion when so inserted is accessible from the outside of the band, and a generally flattened base portion joined to said connecting portion and sized to prevent its own passage through said opening, said base portion being constructed whereby, with said connecting portion inserted through said opening, and said band fitted on a crown, the base portion is clamped in place between the band and the crown.

3,925,894

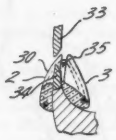
DUAL PURPOSE TOOTH ALIGNER

Lenford L. Robins, 244 Fieldstone Terrace, Riverdale, Bronx, N.Y. 10471

Continuation-in-part of Ser. No. 429,073, Dec. 28, 1973, Pat. No. 3,849,885. This application Aug. 8, 1974, Ser. No. 495,582

Int. Cl.² A61C *7/00*

U.S. Cl. 32—14 B 19 Claims



1. An improved tooth aligner for aligning teeth in both a first and second row of teeth, comprising,

substantially arcuate first and second tooth-aligning members, spaced apart to permit the insertion of said first row of teeth therebetween,

wire support means joining said first tooth-aligning member to said second tooth-aligning member into a predetermined tooth-aligning orientation, said wire support means including a substantially arcuate forward portion cooperating with said first tooth-aligning member and a pair of support arms extending from the ends of said forward portion to said second tooth-aligning member to thereby properly align teeth disposed between said first and said second tooth-aligning members, and

means associated with said first tooth-aligning member to urge the teeth in said second row of teeth into proper alignment, without employing any means continuously associated with said second row of teeth.

3,925,895

HYDROPHILIC ROOT CANAL FILLING MATERIAL

Karel Kliment, Princeton, and Robert S. Tu, East Brunswick, both of N.J., assignors to National Patent Development Corporation, New York, N.Y.

Filed Apr. 26, 1973, Ser. No. 354,866

Int. Cl.² A61K *5/01*

U.S. Cl. 32—15 27 Claims

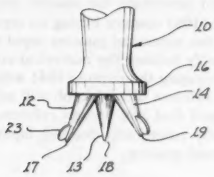
1. A process comprising filling a root canal with a fluid hydrophilic polymerizable material consisting essentially of a member of the group consisting of hydroxy lower alkyl acrylates and methacrylates, hydroxy lower alkyl lower alkoxy acrylates and methacrylates, hydroxy lower alkyl poly(lower alkoxy) acrylates and methacrylates, methacrylamide, acrylamide, N-lower alkyl acrylamides and N-lower alkyl methacrylamides and vinyl pyrrolidone, up to 25% of an alkyl acrylate or methacrylate and 0.05 to 5.0% of a polyethylenically unsaturated monomer as a cross-linking agent.

3,925,896

METHOD AND APPARATUS FOR ENCODING DENTAL WORK

James A. McDowell, 7025 E. McDowell Road, Scottsdale, Ariz. 85257

Filed Sept. 12, 1974, Ser. No. 505,585
Int. Cl.² A22C 11/08
U.S. Cl. 32—40 R 6 Claims



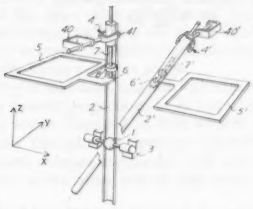
1. Apparatus for encoding information on dental work comprising: a base member, a plurality of tines extending from said base member and arranged in a predetermined pattern, each tine terminating in a point for forming an index point; a plurality of digit indicators each positioned on one of said tines adjacent the point of said tine, each digit indicator positioned on a radial extending from said point.

3,925,897

STEREO-PLOTTING APPARATUS FOR AIR AND EARTH PHOTOGRAMMETRY

Walter Ferri, and Giulio Grassotti, both of Florence, Italy, assignors to Officine Galileo S.p.A., Florence, Italy

Filed May 9, 1973, Ser. No. 358,808
Claims priority, application Italy, May 16, 1972, 9483/72
Int. Cl.² G01C 11/12, 11/24
U.S. Cl. 33—1 A 5 Claims



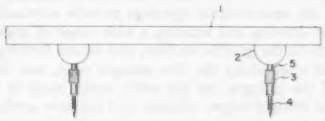
1. In stereo-plotting apparatus for mechanical photogrammetric projection having a frame, a carriage movable along three mutually perpendicular axes, two projection rods each having a concave surface, a universal joint adapted to secure each rod to said frame of the apparatus, joint means connecting the carriage to the rods for universal movement, the joint means being movable with the carriage and slidable with respect to the concave surfaces of the rods along the axis of each rod, and a plate-carrier carriage associated with each rod and being operatively connected to means mounted on said frame for supporting said plate-carrier carriage for movement in its own respective plane, an improvement comprising means connecting each plate-carrier carriage to its respective rod including a pin carried by means located on the upper portion of said rod for permitting axial sliding movement of said pin along said concave surface, said pin having a lower end, and a ball joint connecting said lower end of said pin to said plate-carrier carriage, said ball joint being axially aligned in said rod with said pin and said joint means, and means mounted on each pin for guiding said pin along the concave surface of said rod.

3,925,898

RULER-BEAM

George Melnik, 907 Nottingham Road, Newark, Del. 19711

Filed July 29, 1974, Ser. No. 492,435
Int. Cl.² B43L 9/04
U.S. Cl. 33—27 C 1 Claim



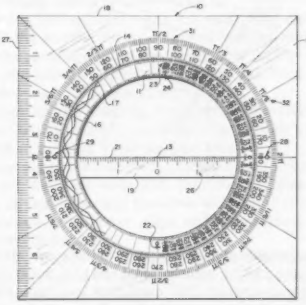
1. A beam compass comprising an elongated beam having an elongated top wall and elongated downwardly extending substantially parallel side walls forming a beam of substantially C-shape in cross-section, the free ends of said walls having inwardly extending bulb shaped projections formed along the entire length thereof; a pair of identical sliders, formed of low friction material, each having elongated grooves receiving said leg projections in intimate surface to surface contact; the distance between said leg projections being less than the distance between the grooves such that an interference fit is formed therebetween; each said slider having means extending therethrough at right angles to the direction of the groove for receiving a point and scriber holders, a point holder and a scriber holder mounted in said means; said interference fit allowing said slider to be adjusted along said beam by a force applied by the thumb and to remain securely in the adjusted position for describing arcs.

3,925,899

GRAPHICS INSTRUMENT

Sarah Hesse, 929 Oxford St., Berkeley, Calif. 94707, and Justin J. Shapiro, 39 Domingo Ave., Berkeley, Calif. 94705

Filed Mar. 19, 1974, Ser. No. 452,635
Int. Cl.² B43L 7/06
U.S. Cl. 33—75 1 Claim



1. A graphics instrument comprising an annular inner scale member having a circular outer periphery and a circular inner periphery, an outer scale member having a circular inner periphery mounted for rotation with respect to the outer periphery of the inner member about a common center, said inner and outer members having co-planar surfaces which are adapted to move over a graphics surface, said outer member being formed with an outer periphery in the configuration of a polygon having adjacent sides which are in orthogonal relation to each other, means forming a first continuous graduated scale about the entire outer periphery of said inner member, means forming a second continuous graduated scale about the entire inner periphery of said outer member in register with said first scale whereby the scale members can be positioned in a selected angular relationship, an elongate member

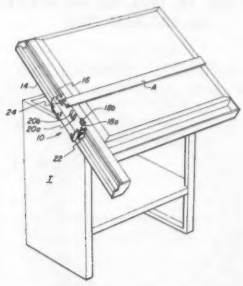
mounted on the inner member, said elongate member being formed with parallel side edges with one of the side edges extending along and forming a first straight edge along a diameter of the inner member, each side edge of the elongate member cooperating with the inner periphery of the inner member to form a pair of substantially semicircular openings of a large area relative to the areas of said co-planar surfaces whereby the semi-circular openings provide substantial open spaces for drawing and locating a wide range of angles, lines and points on the graphic surface, and means forming a third graduated scale along the first straight edge, and the outer edges of the polygon on the outer scale member forming additional straight edges, wherein said polygon configuration comprises a square, and each outer edge of said square configuration comprises a straight edge, wherein the first graduated scale includes indicia displaying a scale of angular degree measurement and indicia indicating a scale of angular radian measurement, wherein the second graduated scale includes indicia displaying a scale of trigonometric function values for the corresponding degree or radian measurements on the first scale, wherein the trigonometric function values include sine and cosine values, and wherein said first straight edge is aligned with the 0° trigonometric function values of said second graduated scale and said first graduated scale is arranged so that its 0° indicia will be in alignment with said first straight edge when said first straight edge is parallel to an outer edge of said square configuration.

3,925,900

COUNTER SYSTEM FOR STEP-AND-REPEAT DRAFTING ARM

John H. Raffensparger, 1412 Shoemaker Rd., Baltimore, Md. 21209

Filed July 30, 1974, Ser. No. 493,085
Int. Cl.² B43L *13/24*
U.S. Cl. 33—81 **5 Claims**



1. In an adjustable step and repeat drafting arm mechanism having: a frame (**26**), a tubular anvil (**66**) on the frame, with a peripheral screwthread (**78**) extending longitudinally along a portion thereof and terminating at a first end thereof and a first reference face (**64**) on the second end thereof, an elongate movable anvil (**72**) with an interior screwthread (**80**) adjacent a first end thereof engaging said peripheral screwthread (**78**); a knob portion (**22**) at the second end of said movable anvil, an elongate shank (**82**) extending axially through and projecting beyond the tubular anvil (**66**) with a first end of said shank connected to said movable anvil; the second end of said shank having a radial protrusion (**70**) with an annular radial surface (**68**) on the inner end of said radial protrusion, said annular radial surface being a second reference face, a sliding block (**46**) disposed between said first and second reference faces with the elongate shank (**82**) passing through a hole in the sliding block (**46**), a rod (**16**) passing through the frame (**26**), means (**20***c*) having pivotal attachment to the sliding block (**46**) for grasping the rod (**16**) and advancing the frame therealong in adjustable increments, and means for indicating said increments, the improvment comprising:

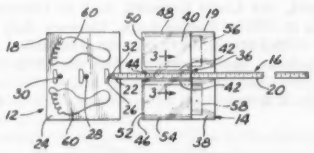
the means indicating including: said radial protrusion having tubular shape (**88**) and having at least one slot (**90**) extending therealong, a shaft (**92**) coaxially aligned with the tubular shape (**88**), means for engaging a first end of the shaft (**92**) with said slot (**90**) such that rotation of said radial protrusion will cause rotation of said shaft, a journal (**98**) rotatably mounting the shaft to said frame, a gear (**100**) fixed proximate the second end of the shaft, a numerical (**106**) counter having an input shaft, a pinion (**104**) on the numerical counter input shaft, and means for adjustably holding the numerical counter (**106**) in a position engaging the pinion (**104**) with the gear (**100**), such that rotation of said knob will adjust the distance between said first and second reference faces and will concurrently rotate said counter input shaft to give a value for said spacing.

3,925,901

SYSTEM FOR MEASURING GROWTH AND HEALTH CHARACTERISTICS

James B. McCormick, 9950 W. Lawrence Ave., Schiller Park, Ill. 60176

Filed Aug. 16, 1973, Ser. No. 388,767
Int. Cl.² G01B *3/10*; A61B *5/10*
U.S. Cl. 33—137 R **3 Claims**

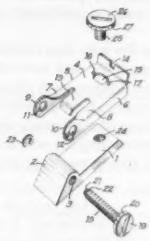


1. A system for use in measuring growth and health characteristics and the like, comprising, in combination, a first generally flat plate member adapted to be placed in a generally flat position on a floor surface or the like, an elongated flexible tape having one end attachable to said first plate member and having dimensional indicia therealong increasing in magnitude from said end attachable to said first plate member, and a second generally flat plate member having guide means thereon cooperable with said elongated measuring tape in a manner to facilitate movement of said second plate member along the length of said measuring tape, said guide means defining registration means cooperable with said measuring tape to indicate the distance between said second plate member and the point of attachment of said one end of said measuring tape to said first plate member, said first plate member having a first fastening means thereon to which said one end of said measuring tape may be attached for use when measuring a person's height, said first plate member having a second fastening means thereon to which said one end of said measuring means may be attached for use when measuring a person's blowing strength, said first plate member having a third fastening means thereon to which said one end of said measuring tape may be attached for use when measuring a person's flexion at the waist.

3,925,902
ADJUSTABLE SIGHT FOR FIRE-ARMS

Georges A. Gevers, Liege, Belgium, assignor to Fabrique Nationale Herstal S.A. en brege, Liege, Belgium

Filed Oct. 1, 1974, Ser. No. 510,997
Claims priority, application Belgium, Dec. 11, 1973, 808471
Int. Cl.² F41G 1/26
U.S. Cl. 33—257 6 Claims



1. An adjustable sight for a firearm, comprising:
a support member having a first transverse threaded bore therethrough adjacent one end thereof perpendicular to the line of sight and a second transverse threaded bore adjacent its other end, said second bore being perpendicular to said line of sight and to said first bore;
a body having a pair of arms extending from one end thereof provided with aligned apertures aligned with said first bore and being outwardly of opposite sides of said support member;
a first screw threaded through said first bore, extending through said aligned apertures and having means bearing against the outer sides of said arms, said body having a resilient tongue between said arms, bearing against said support member to resiliently bias said body to pivot upwardly about said first screw;
an opening in said body aligned with said second bore and having upward projections at its lateral sides;
a second screw threaded in said second bore, extending upwardly through said opening and having a head provided with notches engageable with said projections;
and means at the other end of said body defining a sight notch.

3,925,903
REDUCING THE MOISTURE CONTENT OF A FOODSTUFF BY IMMERSING A FROZEN FOODSTUFF IN THANOL MAINTAINED AT A TEMPERATURE IN THE RANGE OF −20° TO 0°C

James Patrick Ward, Rushden, England, assignor to Lever Brothers Company, New York, N.Y.

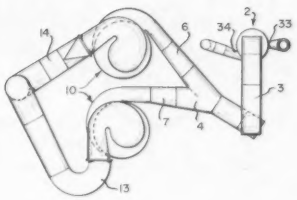
Filed Mar. 9, 1973, Ser. No. 339,797
Claims priority, application United Kingdom, Mar. 17, 1972, 12615/72
Int. Cl. A23b 7/02, 1/04, 3/04
U.S. Cl. 34—9 2 Claims

1. In a method of drying a foodstuff by immersing the foodstuff in ethanol in order to extract moisture from its interior by solution in the ethanol, and subsequently evaporating residual ethanol from the foodstuff, the improvement which consists in the step of immersing the foodstuff in the ethanol while the foodstuff is in the frozen state, and maintaining the temperature of both foodstuff and ethanol in the range −20°C to 0°C until at least half the moisture content of the foodstuff has been dissolved from it so as to produce a substantially unshrunkened product.

3,925,904
METHOD AND APPARATUS FOR DRYING STILLAGE

James G. Kelly, Richmond, Va., assignor to American Brands, Inc., New York, N.Y.

Filed May 14, 1974, Ser. No. 469,790
Int. Cl.² F26B 3/08
U.S. Cl. 34—10 6 Claims



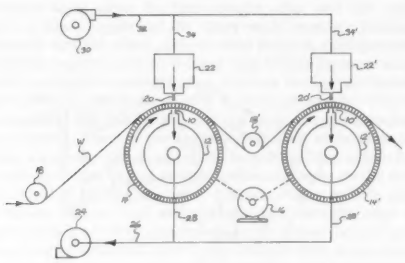
1. A method of drying moist stillage material composed of moisture and moist particles having moisture pervaded throughout the particles comprising
a. maintaining a rapidly moving gas stream emanating from a heat source and moving to one or more gas-stream and particulate-matter separator means which gas stream includes a columnar portion and is heated to a temperature sufficient to volatile moisture on and at the surface area of the particulate matter mixed therewith;
b. continuously introducing non-fluidized material into the columnar portion of the stream to cause the material to be mixed with it and heated by it;
c. causing the material to move a substantial distance along with the stream during which movement moisture on or at the surface area of the particulate matter is removed;
d. separating the material from the gas stream;
e. collecting the separated material;
f. conveying and handling the collected material for a sufficient time to permit moisture in the interior of the particulate to migrate to the surface area;
g. introducing a substantial quantity of the treated material in non-fluidized form back into the columnar portion of gas stream after said moisture migration; and
h. repeating the above steps until the material has been substantially dried,
whereby the stillage is progressively and incrementally dried at temperatures that avoid any substantial reduction in the nutrient value of the stillage and without emitting significant amounts of smoke or odors.

6. Apparatus for drying spent stillage comprising
a. an elongated drying conduit;
b. gas pumping means for pumping a gas at high speed through the conduit;
c. non-fluidized stillage introducing means for introducing the non-fluidized stillage into the conduit as gas passes through the conduit;
d. heating means for heating the gas prior to its entering the conduit;
e. separator means associated with the conduit for separating the material from the gas after it has travelled a distance in the conduit; and
f. recirculating means for introducing a substantial portion of the material back to the stillage introducing means while diverting a portion of the material to a separate location.

3,925,905
PIECE GOODS EXTRACTION APPARATUS AND METHOD

Dieter F. Zeiffer, Charlotte, N.C., assignor to Gaston County Dyeing Machine Company, Mount Holly, N.C.

Filed Aug. 6, 1973, Ser. No. 386,007
Int. Cl.[2] F26B 5/04
U.S. Cl. 34—16 8 Claims

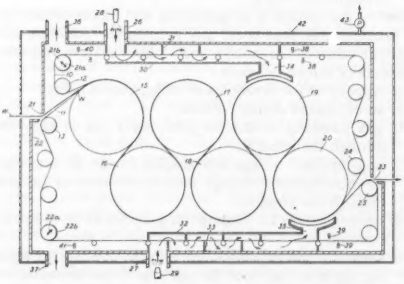


1. Piece goods extraction apparatus comprising means forming a stationary suction slot, traveling reticulate means for passing a moisture-containing piece goods web in spaced relation over said suction slot with the latter oriented transversely of and reaching fully across the web width and having a slot width proportioned for concentrating suction on said web through said traveling reticulate means, means forming an aligned pressure slot disposed opposite said suction slot and closely spaced at the other face of a passing piece goods web, means for impressing stripped moisture recovery suction at said suction slot, and means for delivering air at moisture stripping velocity through said pressure slot, said first and second mentioned means comprising, respectively, a stationary suction chamber and a surrounding openwork roll body of tubular form arranged for rotation, and said suction chamber presenting said suction slot in relation to the inner face of a piece goods web supported at the roll body surface and passed over said slot by roll rotation.

3,925,906
HOT WIRE DRYING

James L. Chance, Rockford, and Shu Tang Han, South Beloit, both of Ill., assignors to Beloit Corporation, Beloit, Wis.

Filed Aug. 14, 1972, Ser. No. 280,667
Int. Cl.[2] F26B 7/00
U.S. Cl. 34—18 12 Claims

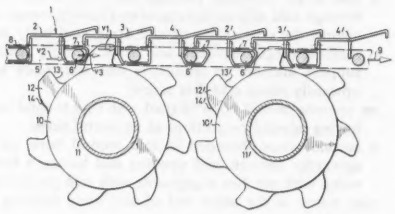


1. An apparatus for drying a traveling fibrous moisture containing web which comprises in combination:
first and second flexible pervious looped wire belts formed of highly heat conductive metal;
means for guiding a fibrous moisture containing web between the wire belts for heating the web by conduction and convection from the wires of the belts;
a plurality of dryer drums over which the wire belts are trained to travel in a serpentine path for carrying the web through a drying path sandwiched firmly between the wire belts insuring heat conducting drying contact between the wire belts and the web;
a first heating chamber positioned in advance of the drying path with said first wire belt passing therethrough;
a second heating chamber positioned in advance of the drying path with said second wire belt passing therethrough;
a first heating means for said first chamber;
a second heating means for said second chamber; each of said heating means heating each of said wires to a high temperature sufficient to heat the web by contact with the wire belt to evaporate the moisture and dry the web;
and an enclosure surrounding the web and wire belts in said dryihg path for receiving moisture evaporating from the web.

3,925,907
PROCESS AND APPARATUS FOR COOLING OF FIRED OR SINTERED MATERIAL

Otto Heinemann, Ennigerloh, Germany, assignor to Polysius AG, Neubeckum, Germany

Filed Sept. 30, 1974, Ser. No. 510,438
Claims priority, application Germany, Oct. 10, 1973, 2350811
Int. Cl.[2] F26B 7/00; F27B 9/14
U.S. Cl. 34—20 10 Claims



1. In a method of cooling a layer of fired or sintered material supported on a straight portion of an air permeable support movable at a substantially constantly speed in one direction and composed of a plurality of relatively movable plates coupled to one another, the improvement comprising periodically varying the speed of movement of adjacent plates in said straight portion of said support whereby adjacent plates of said straight portion have a periodically varying resultant rate of movement in said direction.

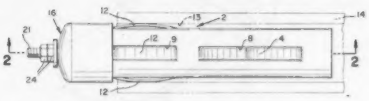
5. Apparatus adapted for use in the cooling of fired or sintered material comprising a plurality of grate plates fitted to one another and together forming a grate band having an air permeable support surface on which a layer of such material may rest; drive means movable in one direction; lost motion means coupling said grate plates to said drive means whereby said grate plates and said drive means are capable of relative movement; and additional driving means engageable with selected ones of said grate plates during their movement by said drive means for varying the rate of speed of said selected ones of said grate plates relative to the rate of speed of said drive means.

3,925,908

PAINT BRUSH AND PAINT ROLLER CLEANING DEVICE

Kirkley J. Dunn, 818 Cristich Lane No. 3, Campbell, Calif. 95008

Filed Jan. 9, 1975, Ser. No. 539,924
Int. Cl.² F26B 17/00; B08B 11/02
U.S. Cl. 34—58 4 Claims



1. A paint brush and paint roller cleaning device, comprising:

a. an elongated tubular body symmetrical about a longitudinal axis;

b. means on one end of the tubular body including a shaft adapted to be mounted in the chuck of a drill motor or other rotative device; and

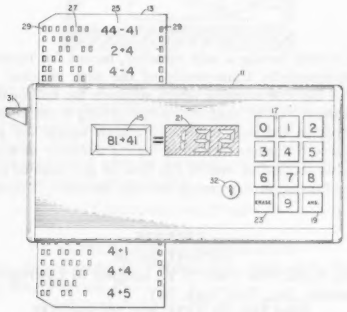
c. means formed in the wall of the elongated tubular body adapted to retain the handle of a paint brush when inserted into the interior of said elongated tubular body and adapted to retain a paint roller when the latter is slipped around the exterior of the tubular body.

3,925,909

TEACHING MACHINE

Ernest R. Duncan, Mount Harmony Road, Harmony Hill, Bernardsville, N.J. 07924

Filed July 24, 1973, Ser. No. 382,273
Int. Cl.² G09B 7/02
U.S. Cl. 35—9 A 15 Claims



11. A teaching machine comprising:

a housing adapted to receive a record member;

a keyboard on said housing, in which a student enters one at a time on said keyboard the answers to a plurality of problems serially presented to him;

a display on said housing, constructed and arranged for displaying the answers to said problems when the correct answer is entered; and

actuatable interrogating means comprising:

means for counting the number of answers attempted and number of correct answers entered by the student on said keyboard; and

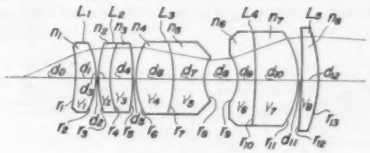
actuatable means for enabling the display on said display of the contents of said counting means.

3,925,910

OBJECTIVE LENS SYSTEMS FOR USE IN MICROSCOPES

Masaki Matsubara, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 277,040, Aug. 1, 1972, abandoned. This application May 1, 1974, Ser. No. 466,044
Int. Cl.² G02B 9/60, 1/00
U.S. Cl. 350—218 6 Claims



1. An objective lens system for use in microscopes, constructed as five components and eight lenses of the Gauss type, consisting of a first component of a single positive lens, a second component of a compound positive lens, third and fourth components of compound negative lenses, and a fifth component of a single positive lens, all lenses arranged in succession from the side of the object,

wherein N.A. = 0.4, Magnification = 20 X, $f = 11.51$, $f_1 = 11.108$ and r_1 to r_{13}, d_0 to d_{12}, n_1 to n_8 and ν_1 to ν_8 are defined by the following values:

	d_0 =5.0		
r_1 =16.437	d_1 =1.93	n_1=1.788	ν_1=47.5
r_2 = −6.007	d_2 =0.11		
r_3 = 15.0	d_3 =1.09	n_2=1.6398	ν_2=34.6
r_4 = 7.304	d_4 =2.14	n_3=1.48656	ν_3=84.5
r_5 =−14.127	d_5 =0.28		
r_6 = 6.923	d_6 =3.44	n_4=1.618	ν_4=63.4
r_7 =−11.03	d_7 =3.03	n_5=1.62588	ν_5=35.7
r_8 = 3.982	d_8 =3.02		
r_9 = −3.127	d_9 =1.62	n_6=1.64769	ν_6=33.8
r_{10}=−63.654	d_{10}=4.2	n_7=1.48656	ν_7=84.5
r_{11}= −6.629	d_{11}=0.16		
r_{12}=−88.716	d_{12}=1.7	n_8=1.6968	ν_8=56.5
r_{13}=−11.782			

where

f is the focal length of the total lens system;

f_1 is the focal length of the first component of the single positive lens;

r_1, r_8, r_9 are radii of curvatures of the front concave surface of the first component of the single positive lens, rear and front concave surfaces of the third and fourth components of compound negative lenses, respectively;

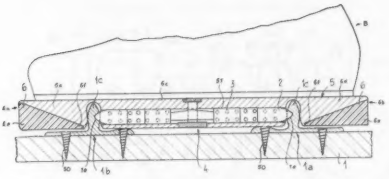
d_1 is the axial thickness of the first component of the single positive lens; and

ν_3, ν_7 are Abbe's numbers of the positive lenses of the second and fourth components of compound negative lenses, respectively.

3,925,911
SKI BOOT

Richard Erlebach, Kleinwalsertal, Austria, assignor to Gertsch AG, Interlaken, Switzerland

Division of Ser. No. 282,548, Aug. 21, 1972, Pat. No. 3,834,723. This application Apr. 29, 1974, Ser. No. 464,960
Claims priority, application Germany, Aug. 19, 1971, 2141675
Int. Cl.² A43B 00/00
U.S. Cl. 36—2.5 AL 4 Claims

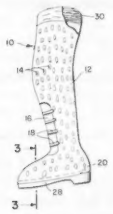


1. A ski boot embodying a ski boot sole having a toe portion and a heel portion and an intermediate sole portion formed of essentially rigid material arranged between said toe portion and said heel portion, said toe portion and said heel portion of said ski boot sole being formed of an elastically compressible material.

3,925,912
VENTILATED BOOT

Florianne Martineau, St. Leonard, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed July 31, 1974, Ser. No. 493,413
Int. Cl.² A43B 7/06
U.S. Cl. 36—3 R 4 Claims



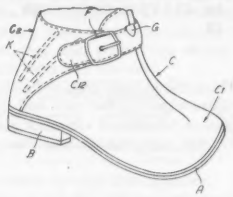
1. Footwear comprising, in combination, a sole-heel member; a false sole secured on top of said sole-heel member; front and back foot support members secured on top of said false sole and a ventilated foot and leg encasing member secured about the periphery of said false sole and covering said front and back support members; said foot and leg encasing member having a plurality of spaced openings therein and being formed by crocheting.

3,925,913
SHOE HAVING A TWO-PART VAMP

Oscar Del Vecchio, Via Manara 6, Falconara Marittima, Ancona, Italy

Filed May 6, 1974, Ser. No. 467,726
Int. Cl.² A43B 3/12
U.S. Cl. 36—11.5 6 Claims

1. A shoe for deformed feet particularly for children's feet, comprising, in combination a sole with a shaped undersole, said undersole adapting to the instep of the foot; a first vamp element fixed to the front part of said sole to retain the end of the foot; a second substantially triangularly shaped vamp element with one of the vertexes of said second vamp element fixed to the rear part of said sole, the other vertexes of said triangle being joined to one another in the form of a ring; and joining members for holding the shoe to the neck of the foot, said rear element of the vamp having substantially the form of

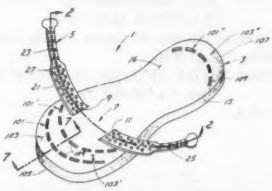


an isosceles triangle, the vertex whereof, opposite to the base, can be anchored to the heel of the shoe below the undersole, the base of said triangular element being ring-shaped, the diameter of said ring-shaped element being variable, so as to restrain said ring-shaped element to the instep of the foot.

3,925,914
SANDAL

Emery Marcoux, 445a Fleury St., Montreal, Quebec, Canada

Filed Aug. 19, 1974, Ser. No. 498,365
Claims priority, application Canada, Aug. 20, 1973, 179208
Int. Cl.² A43B 3/12
U.S. Cl. 36—11.5 9 Claims



1. A sandal having a sole member, means for mounting a strap substantially transversely of the sole member in the region of the sole member which supports the ball of the foot of the sandal wearer, said means comprising a pair of longitudinal slots in the sole member through which the strap is threaded and further including means defining at least one removable section at one of the heel or toe ends of the sole member for use in shortening the sole member, if desired.

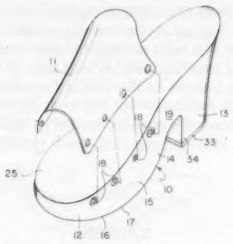
3,925,915
SANDAL SHOE

J. Louise Colli, New York, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y.

Filed Feb. 19, 1975, Ser. No. 551,033
Int. Cl.² A43B 3/12
U.S. Cl. 36—11.5 6 Claims

1. A sandal shoe, which comprises:
a. a shoe bottom having a forward sole portion, a middle shank, and a raised heel;
b. said middle shank extending rearwardly upward from said forward sole portion to an upper end of said raised heel;
c. a bottom base of said forward sole portion having a convex curvative;
d. a rubber sole affixed onto said bottom base of said forward sole portion;
e. a rubber base element affixed onto a bottom end of said raised heel;
f. a plurality of male snap members contained in each sidewall of said shoe bottom, wherein said male snap members are arranged in a row extending from said forward sole portion to said middle shank;

g. a vamp portion; and



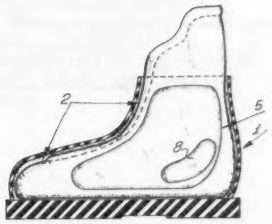
h. said vamp portion having a plurality of female snap members, wherein said female snap members communicate with said male snap members.

3,925,916

FOOT-FITTING INSERT FOR SKI BOOT OR THE LIKE

Carlo Garbuio, Volpago del Montello, Treviso, Italy

Filed Aug. 22, 1974, Ser. No. 499,406
Claims priority, application Italy, Oct. 4, 1973, 29732/73
Int. Cl.[2] A43B *19/00*
U.S. Cl. 36—71 **9 Claims**



1. An insert for a boot; comprising a foot-fitting liner of flexible sheet material including an elastomeric core sandwiched between two skins, at least part of said core having a multiplicity of interstices filled with air, said skins including a fabric impregnated with an air-impervious mass to form an airtight envelope about said part.

3,925,917

ASTROLOGICAL APPARATUS

Teodosio Jose Concha C, Pittston, Pa., assignor to Ver-Con, Inc., West Pittston, Pa.

Filed June 7, 1973, Ser. No. 367,726
Int. Cl.[2] G03B *23/12;* **G09F** *11/295;* **G04C** *23/00*
U.S. Cl. 40—31 **1 Claim**

1. An apparatus for presenting astrological data relating to said individual horoscope comprising; in combination:

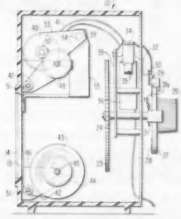
a. a housing having a front member, a top member, a bottom member and two side members;

b. a timing means fixed to said housing and providing repetitively an enabling control signal upon the expiration of each successive first time interval of a first given duration of 24 hours and a disabling control signal upon the expiration of each successive second time interval of a second given duration measured from the time of occurrence of the enabling signal, the disabling signal being produced subsequent to the enabling signal and said second time interval having a duration of less than 24 hours;

c. a first pair of spaced apart brackets fixedly mounted within said housing on said front member in close vicinity to said bottom member, each bracket of said first pair of brackets having a respective bearing surface spaced from said front member for removably supporting a spool-like member;

d. a first free running roller mounted between the brackets of said first pair of brackets, said first free running roller being positioned between said front member and said bearing surfaces of said first pair of brackets in close vicinity of said front member;

e. a second pair of spaced apart brackets fixedly mounted within said housing on said front member in close vicinity to said top member, each bracket of said second pair of brackets having a respective bearing surface spaced from said front member for removably supporting a spool-like member;



f. a second free running roller mounted between the brackets of said second pair of brackets, said second free running roller being positioned between said front member and said bearing surfaces of said second pair of brackets in close vicinity of said front member;

g. an opaque strip in the form of a roll storing astrological data related to an individual horoscope;

h. a first spool-like member positioned within said housing and supported by said bearing surfaces of said first pair of brackets;

i. second spool-like member positioned within said housing and supported by said bearing surfaces of said second pair of brackets, said opaque strip being carried by said first spool-like member and extending, via said first and second free-running rollers, to said second spool-like member;

j. a further bracket fixedly mounted on said front member in close proximity to one bracket of said second pair of brackets, said further bracket including an upstanding portion spaced from said front member;

k. an electric motor supported by a pivotable support movably mounted on said upstanding member;

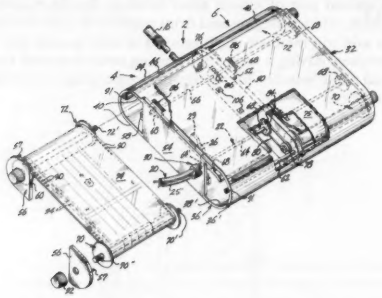
l. drive means including a surface drive roller and an electric motor having a drive shaft connected to said drive roller positioned within said housing on said pivotable support, said electric motor being coupled to said timing means and responsive to said two control signals therefrom for moving said opaque strip selectively at a fixed velocity for a given period once each interval of 24 hours thereby selectively retrieving from said opaque strip in the form of a roll for storing respective different portions of the stored astrological data related to an individual horoscope in response to each excessive occurrence of a signal pair composed of the enabling control signal and the disabling control signal; and

m. a viewing aperture in said front member of said housing between said first and second free running rollers for receiving the selectively retrieved data relating to an individual horoscope for making a different respective portion of said different portions available for viewing once every 24 hours.

3,925,918
DASHBOARD-MOUNTED AUTOMATIC ROUTE INFORMATION DISPLAY DEVICE

Charles Pelin, P.O. Box 18, Eastsound, Wash. 98245

Continuation of Ser. No. 265,647, June 23, 1972, abandoned.
This application Sept. 23, 1974, Ser. No. 508,669
Int. Cl.² G09F 11/24
U.S. Cl. 40—42 10 Claims

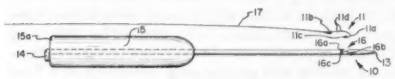


1. In a roadway route information display device, a case, carrier means and a rotatably mounted takeup spool in the case, an elongated, windable roadway route information strip disposed on the carrier means and extending lengthwise in a plane between the spool and the carrier means in engagement with the spool, a transparent cover on the case above the strip, means defining an elongated slot which extends in a plane below the cover on a parallel to the plane of the strip, means on the case defining openings to the outside thereof adjacent the opposite ends of the slot and the carrier means and spool, respectively drive means operative to advance the strip in the longitudinal direction thereof relatively from the carrier means toward the spool and to wind the strip on the spool, a second elongated, free-ended route information strip disposed in the slot and the opening adjacent the carrier means, and engaged with the drive means to be driven lengthwise in the plane of the slot in unison and co-directional with the windable strip, and means for guiding the free end of the second strip relatively out of the opening adjacent the other end of the case, after said second strip has traversed the length of the slot.

3,925,919
BAITING DEVICE

Clinton C. Huth, P.O. Box 156, Wisdom Pack Station, West Yellowstone, Mont. 59758

Filed Apr. 16, 1973, Ser. No. 351,147
Int. Cl.² A01K 31/06
U.S. Cl. 43—4 3 Claims



1. A method for installing an item of bait onto a fish hook attached to a fishing line using a baiting device having a hand engaging portion and a straight rod portion extending therefrom, which straight rod portion has a notch formed on a bias therein, which notch slants towards said hand engaging portion comprising the steps of

installing a curved portion of the fish hook within the notch formed in the baiting device rod;

pulling taut the fishing line against an eyelet end of said fish hook to seat the fish hook curved portion within the notch;

securing the fishing line in a taut state against the baiting device handle portion;

inserting the end of the baiting device rod opposite to the handle portion thereof into the body of an item of bait;

inserting the baiting device rod into said item of bait, while passing the fish hook arranged in the notch in the baiting device rod into said body of said item of bait;

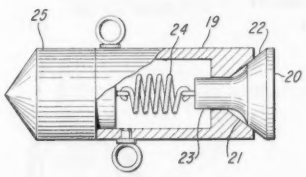
releasing the tension on the fishing line; and

separating the baiting device rod from the body of the item of bait through the opening formed by insertion of the rod thereinto while leaving each hook positioned therein in place.

3,925,920
RELEASABLE LINE-HOLDING DEVICE

William S. Walker, Portage, Mich., assignor to Pacific-Atlantic Products, Ltd., Portage, Mich.

Filed Mar. 29, 1974, Ser. No. 456,132
Int. Cl.² A01K 95/00
U.S. Cl. 43—43.12 8 Claims



1. A releasable, fishing line-holding device for use with a downrigger line and weight system for trolling, for releasably holding a fishing line to the downrigger system, said device comprising a hollow outer housing having a line-holding end with a bore passing therethrough and a leading end, the bore of said outer housing at its line-holding end being tapered progressively smaller from the outside inwardly, a poppet-shaped, line-holding plug member having a tapered line-holding portion and a plug stem, said tapered line-holding plug portion tapering progressively smaller in diameter toward the juncture of said tapered line-holding plug portion with said plug stem, the angle of taper of the bore at the line-holding end of said outer housing being substantially equal to the angle of taper of said tapered line-holding plug portion so as to provide a line-holding seat in the line-holding end of said outer housing for said tapered line-holding plug portion, the diameter of of said plug stem being less than the inside diameter of the bore at the base of the line-holding seat in said line-holding end of said outer housing, said line-holding plug member being positioned with said plug stem projecting into said outer housing and the tapered surface of said line-holding plug portion resting against the tapered line-holding seat in the line-holding end of said outer housing, the size of said tapered line-holding plug portion being sufficiently large so that part of said line-holding plug portion projects outside the end of said outer housing, means for resiliently urging said tapered line-holding plug portion against the tapered line-holding seat in said line-holding end of said outer housing, and means for attaching said device to the downrigger system at an angle thereto whereby said line-holding end of said device is at an angle measured against the horizontal of between 20° above the horizontal and 45° below the horizontal.

3,925,921
FISHING SINKER

John L. Tucker, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York; N.Y. 10007

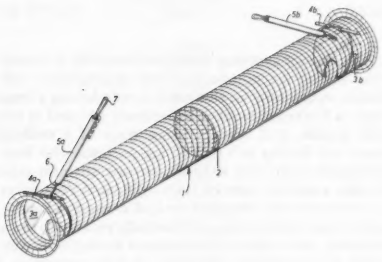
Filed Sept. 5, 1974, Ser. No. 503,343
Int. Cl.² A01K 95/00
U.S. Cl. 43—43.12 4 Claims

1. In an improved fishing sinker, the combination of a sinker body made of suitable material so as to sink in water, an eylet opening on said sinker for a fishing line to be attached therein, and means whereby said fishing line is freed from said sinker body in case said sinker body becomes snagged behind an underwater obstacle, wherein said means comprises a weakened, thin neck between said body and an eyelet portion having said opening.

3,925,922
MOLE TRAPS

Pierre Foltier, Orleans, France, assignor to Fonderies & Ateliers des Sablons, France

Filed Mar. 21, 1975, Ser. No. 560,983
Int. Cl.² A01M 23/08
U.S. Cl. 43—66 7 Claims

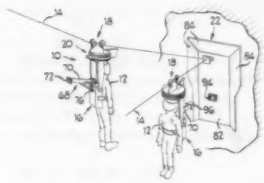


1. A mole trap comprising a tubular enclosure having an open end and a closure wall spaced from said open end, a movable wall connected to said tube at said open end for pivotal movement about an axis, which wall the animal pushes back on entering the tubular enclosure and which afterwards returns to its initial position, an attachment in the form of a tube disposed outside the tubular enclosure for projecting above the surface of the ground when the trap is buried in the ground, and a resilient element slidably mounted in said tube and having one end engaged with the movable wall and an opposite end bent in the form of loop and having a free extremity fitted into the free end of said tube, when the trap is put into place, said free extremity of said loop being displaced from the free end of the tube when the animal enters the trap so that said free extremity comes to lie outside the outer surface of the tube when the movable wall returns to its initial position and the resilient element is retracted back into the tube.

3,925,923
BUBBLE GUN TOY

John E. La Fata, 2714 E. Bolker Circle, Port Hueneme, Calif. 93041, and John D. Cuccio, 808 N. Signal St., Ojai, Calif. 93023

Filed Nov. 18, 1974, Ser. No. 524,466
Int. Cl.² A63H 33/28
U.S. Cl. 46—7 18 Claims



1. A bubble gun comprising:
a. a casing simulating a gun and having a front section and a rear section;
b. a cylinder positioned within and extending laterally across the casing front section;
c. a first port through an end portion of the cylinder;
d. a second port through an intermediate portion of the cylinder;
e. pumping means coupled to the casing for alternately driving a charge of compressed air sequentially through the first and second ports and drawing a fresh charge of air sequentially back through the second and first ports;
f. a shuttle in the cylinder arranged for travel between the first and second ports, the shuttle being lifted beyond the second port when a charge of compressed air is driven through the cylinder and dropped to a level adjacent the first port when a fresh charge of air is drawn through the cylinder;
g. an arm connected to the shuttle;
h. an annular-shaped reservoir for holding bubble-producing liquid coupled to the casing front section and having a slot formed in an inner wall portion; and,
i. a dip ring carried by the arm and oriented to pass through the reservoir slot and into the reservoir as the shuttle is dropped, and, be lifted from the reservoir as the shuttle is lifted.

3,925,924
AERIAL BACK PACK FOR USE WITH A FIGURE TOY

Palmer J. Schoenfield, Evanston, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

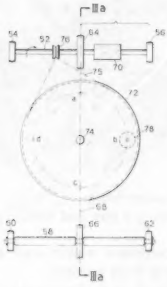
Filed Sept. 12, 1974, Ser. No. 505,594
Int. Cl.² A63H 21/04
U.S. Cl. 46—201 15 Claims

15. An aerial pack accessory for use with a figure toy or the like, comprising: a housing having a securing device for removably securing the housing to the figure toy, guide means including a support frame for supporting the figure toy for movement along a guide wire or the like, and a guide wire for positioning beneath said support frame, one end of the guide wire being securable to a wall or the like whereby the free end of the guide wire may be raised to cause the aerial pack accessory to move toward the wall and lowered to cause the aerial pack accessory to move away from the wall to carry the removably secured figure toy therewith.

3,925,925
TOY AUTOMOBILE

Shaul P. Ladany, 5700 Arlington Ave., Apt. 16J, Bronx, N.Y. 10471

Filed Apr. 25, 1974, Ser. No. 464,122
Int. Cl.² A63H 17/36
U.S. Cl. 46—213 6 Claims

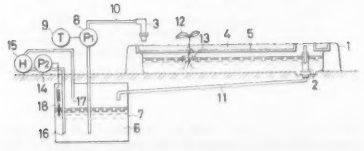


1. A toy automobile comprising a front axle having a pair of wheels, a rear axle having a pair of wheels, the wheels of one of said axles being fixed thereto, a drive for rotating said one axle to propel the automobile, and cyclically operable mechanism for continuously changing the direction of motion of travel of the automobile to cause the automobile to travel in a series of continuously changing curved paths, wherein said one axle driven by the drive includes a large wheel of larger diameter than the pair of wheels on that axle and disposed between said pair of wheels, and wherein the cyclically operable mechanism includes a weight cyclically shiftable from one side of the automobile to the other, to cause the automobile to tip to one side and then to the other during its travel, whereby during one period of the cycle the large wheel and one of said pair of wheels engage the ground for driving the automobile along a circular arc in one direction, and during the other period of the cycle the large wheel and the other of said pair of wheels engage the ground for driving the automobile along a circular arc in another direction.

3,925,926
METHOD AND APPARATUS FOR WATER AND AIR CULTURE OF PLANTS

Nozawa Shigeo, Takatsuki, Japan, assignor to Kyowa Kagakukogyo Kabushiki Kaisha, Japan

Filed Nov. 8, 1973, Ser. No. 413,949
Int. Cl.² E03C 1/08; A01G 31/00
U.S. Cl. 47—1.2 1 Claim

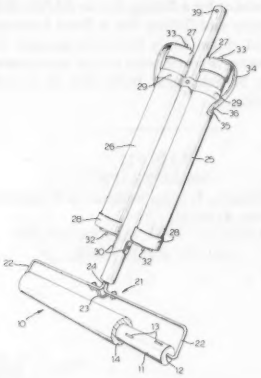


1. An improvement in an apparatus for water and air culture comprising: a culture bed packed with a support for a plant and positioned at an upper level of a plantation vessel; a plantation vessel accommodating the culture bed to be supplied with a culture solution so that the solution may pass through a lower space of the culture bed; means for supplying the culture solution from a tank to the plantation vessel at one end thereof for a period of time controlled by control means including a timer, said supplying means including means for incorporating air into the culture solution while the solution is being supplied; a drain tube having means for regulating the highest and lowest liquid levels by an adjustable slot of the tube provided at the other end of the plantation vessel; and a tank for containing the culture solution of a temperature suitable for causing a plant to grow and for receiving the culture solution flowing out from the drain tube, the means for supplying the culture solution being provided with a nozzle having air intakes and slitter means, and positioned above the one end of the vessel.

3,925,927
HERBICIDE ROLLER FOR WEED CONTROL

Thomas Harry Linton, 48 Farmcrest Drive, Agincourt, Ontario, Canada

Filed Feb. 8, 1974, Ser. No. 440,940
Int. Cl.² A01C 15/02; A01G 1/12
U.S. Cl. 47—1.5 3 Claims



1. A device for applying a selected herbicide to weeds from a roller having a synthetic wax base impregnated with said herbicide, comprising an elongated handle having a longitudinal axis, a U-shaped bracket transversely secured at one end of said handle, said bracket being made of a resilient rod element and having two spaced leg portions with free ends bent towards each other to form axes operative for mounting said roller rotatably thereon, two cylindrical containers slidably and removably mounted on said elongated handle, said cylindrical containers being substantially parallel to the axis of said handle, said cylindrical containers having two open ends covered by removable caps, one of said containers being adapted for holding said roller when the device is not in use and the other container being adapted for holding a replacement roller.

3,925,928
AIR CONDITIONING, SOIL IRRIGATION, FERTILIZATION AND PEST-FIGHTING PLANT FOR USE IN GREENHOUSES

Petre Constantinescu; Nicolae Hristea; Speranta Blebea; Ieronim Hristea, all of Bucharest; Mihai Huniadi, Judetul Ilfov, and Mircea Gabureanu, Bucharest, all of Romania, assignors to Intreprinderea 30 Decembrie, Judetul Ilfov, Romania

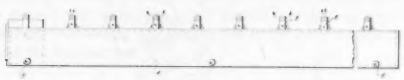
Filed July 2, 1974, Ser. No. 485,295
Claims priority, application Romania, July 23, 1973, 75562
Int. Cl.² A01G 9/00
U.S. Cl. 47—17 1 Claim

1. In a greenhouse having a roof supported on rows of pillars, the improvement which comprises an environmental control installation, said installation comprising a plurality of elongated air-distribution ducts extending toward the interior

of the greenhouse over an end of each duct proximal to an external wall;

a respective air-displacement unit mounted on said end of a respective duct, each of said ducts comprising a U-section light weight reinforced concrete member and precast concrete slabs covering said members, said members being disposed overhead along respective rows of said pillars;

a respective spray means disposed between each of said units and a respective duct for spraying water into the air displaced along the duct, said ducts each being formed with outlets along an upper side thereof, and means for



selectively directing the air from said outlets upwardly, and laterally;

a CO_2 injection station connected with said spray means for injecting carbon dioxide into the water sprayed into the air displaced by said units;

an emulsion preparing station connected with said units for distributing an anti-pest emulsion into the air displaced thereby; and

a network of pressureless distribution conduits connecting said ducts and supplying same with irrigation and fertilizer liquid, said conduits being formed with dropping pipes for dripping liquid from said distribution conduits.

3,925,929

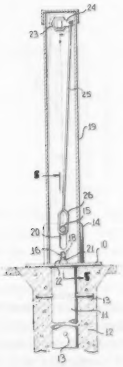
PARKING SPACE BARRIER

George R. Montgomery, 1152 Okeechobee Road, West Palm Beach, Fla. 33401

Filed Mar. 21, 1975, Ser. No. 560,334

Int. Cl.² E05B *65/00*

U.S. Cl. 49—35 **5 Claims**



1. A parking space barrier comprising a base adapted to be anchored to a floor or to ground and having a pair of spaced upright elements, a cross pin secured to and extending between said elements near their upper ends, opposing shear pins removably mounted on said elements near their lower ends and below said cross pin and projecting interiorly of said elements, a barrier post engaged between said upright elements and having bottom end opening slots in opposite sides thereof engaging over the shear pins removably and having vertically elongated closed end slots in the same opposite sides thereof above the first-named slots and slidably and pivotally receiving said cross pin, a key lock on said post near the top thereof including a rotary crank arm within the post, and a link connected with said crank arm and moved thereby and extending through the post and having a lower end loop receiving said cross pin with sufficient play between the loop and cross pin to allow the loop to be lowered by turning of the crank arm to release the post for lifting relative to the cross pin sufficiently to separate said shear pins from said first-named slots.

3,925,930

BARRIER DEVICE

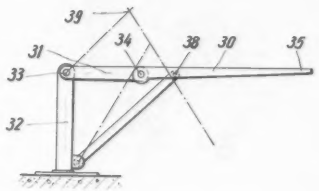
Josef Gail, 8891 Unterwittelsbach 1, and Josef Kauferle, Dachauerstrasse 8, 8890 Aichach, both of Germany

Filed Jan. 7, 1974, Ser. No. 431,431

Claims priority, application Germany, Jan. 10, 1973, 2300944

Int. Cl.² E06B *11/00*

U.S. Cl. 49—124 **6 Claims**



1. A barrier device operative to selectively block a roadway comprising:

a vertical column fixed in the ground adjacent said roadway;

a barrier arm having a rigid generally straight solid body portion extending between a free end and an articulated end of said barrier arm, said barrier arm being mounted upon said vertical column to extend generally horizontally therefrom with said articulated end proximate said column and with said free end remote therefrom to block said roadway,

and to extend generally vertically and parallel to said column with said free end below said articulated end to unblock said roadway;

a rigid generally straight support member having a pair of ends, one of said ends of said support member being pivotally mounted to said barrier arm at a point thereon intermediate said free end and said articulated end, with the other of said ends of said support member being pivotally mounted to said vertical column; and

operating means pivotally mounting said articulated end of said barrier arm to said vertical column, said operating means including means for raising and lowering said articulated end relative to said vertical column.

3,925,931

VEHICLE WINDOW CONTROL SYSTEM

Floyd N. Ladd, Warren, and Donald G. Stacy, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 5, 1974, Ser. No. 489,273

Int. Cl.² E05F *11/52*

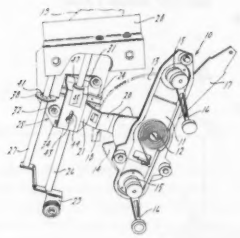
U.S. Cl. 49—227 **4 Claims**

1. A vehicle window control system for controlling the movement of a window panel during the raising and lowering thereof, comprising:

a window regulator mechanism mounted on a vertical panel of a vehicle body structure and having a swingable driving arm,

a primary and a secondary guide rod, each rod being longitudinally curved,

separate upper and lower brackets each fastened to the vehicle body structure to provide common supports for the respective ends of the guide rods,
the guide rods being positioned in parallel proximate relationship to each other with the direction of curvature of the rods extending laterally away from the vertical panel,
a unitary carriage to which the window panel is directly secured,
the carriage straddling the primary and secondary guide rods for slidable movement therealong,
the carriage having two point engagement with the primary guide rod and single point engagement with the secondary guide rod,
coupling means coupling the swingable driving arm to the carriage intermediate the two point engagement of the latter with the primary guide rod,



the two point engagement of the carriage with the primary guide rod comprising upper and lower guide bushings mounted respectively in vertically spaced flanges carried on a part of the carriage,
the guide bushings complementarily encompassing the primary guide rod to stabilize movement of the carriage therealong,
and the one point engagement of the carriage with the secondary guide rod comprises an elongated guide bushing mounted in a third flange on the carriage,
the third flange being vertically intermediate the vertically spaced flanges and integral with the same part of the carriage carrying the latter,
the elongated bushing restraining the carriage against rotation around the primary guide rod.

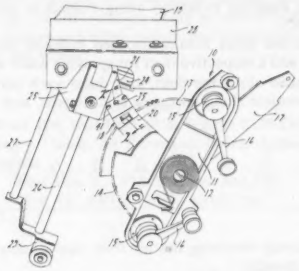
3,925,932

WINDOW REGULATOR MECHANISM

Floyd N. Ladd, Warren, and Donald G. Stacy, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 5, 1974, Ser. No. 489,274
Int. Cl.² E05F *11/52*
U.S. Cl. 49—227 **5 Claims**

1. A window regulator mechanism having a mounting plate,
a planar gear sector mounted on the mounting plate for rotation about a fixed axis,
and an articulated drive arm swingable about the fixed pivot axis of the gear sector,
the drive arm having a first section fixed to the gear sector for swinging movement in a plane with the latter and a second section having coupling means adapted to couple the drive arm to a window panel guided for vertical movement on guide means curved laterally of the panel,
the first and second sections of the drive arm having longitudinally overlapping portions intermediate the gear sector and coupling means ends,
and coacting pivot means coupling the overlapping portions of the arm sections together,
the second section being pivotable on the pivot means in a direction traversely of the plane of swinging movement of the first section about the gear sector pivot axis,
the overlapping portions of the first and second sections having interlocking means coacting with the pivot means to maintain the sections in substantial longitudinal alignment during swinging movement,



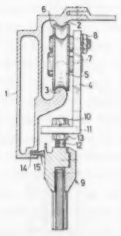
the pivot means and the interlocking means including lost motion means providing for longitudinal movement of the second section relative to the first section as the length of the drive arm varies as the second arm section pivots relative to the first arm section about the pivot means therebetween.

3,925,933

STRUCTURAL MEMBERS FOR MOUNTING AND GUIDING SLIDING DOORS

Manfred Reuter, Misburg, Germany, assignor to Georg Spellmann Hannov.-Holz-Industrie, Hannover-Kleefeld, Germany

Filed Jan. 4, 1974, Ser. No. 430,812
Claims priority, application Germany, Jan. 8, 1973, 2300692
Int. Cl.² E05D *13/02*
U.S. Cl. 49—409 **1 Claim**



1. A structural member for mounting and guiding sliding doors for a building structure comprising:
an integral extrusion profile having opposed, linear runner and guide rails arranged vertically with the guide rail disposed above the runner rail, said extrusion including an integrally formed hollow box section disposed between the runner and guide rails for increasing the torsional and structural rigidity of said extrusion, said extrusion profile includes a recess for accommodating a lower part of a fanlight, said extrusion profile having an upwardly projecting trapozoidal portion adjacent said upper guide rail having a horizontal slot;
a horizontal member having an inclined "L" shaped end with a horizontal part snuggly engaged in said slot;
an L-shaped carriage having one arm pivotably coupled to said rollers, said carriage having at least one oblong hole for adjustable receiving at least one guide roller so that said guide roller is vertically adjustable between said opposed rails;

runner and guide rollers being pivotably mounted to said carriage, and said carriage comprising fastening screw means for supporting the door vertically below the rollers, said fastening screw means being adjustable with respect to said carriage so as to permit the height of the door to be adjustable;

said runner and guide rollers engaging the runner and guide rails respectively, said rollers having a concave runner cross section;

said hollow box section forming an opening having a vertical depending lowermost portion extending below said runner rails, and said L-shaped carriage to form a connice with the door, and including adjacent said lowermost vertically depending opening portion a thickened corner portion having a groove and a sealing ledge disposed in said groove for slidably contacting and sealing the space between the door and the box section.

3,925,934

DOOR FRAME

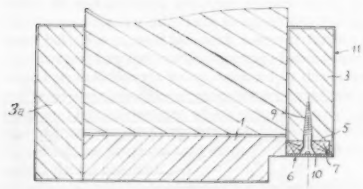
August Bürgers, Erkelenz-Gerderath, Germany, assignor to Europatent S.A., Luxemburg

Filed Oct. 1, 1973, Ser. No. 402,583

Claims priority, application Germany, Sept. 30, 1972, 2248151

Int. Cl.² E06B *1/04*

U.S. Cl. 49—504 4 Claims



1. A door frame with a lining having a step-shaped portion on each side, which includes: two vertical cover parts separated from each other by said lining and extending at a substantially right angle thereto while having one side portion in engagement with the respective adjacent outermost end face section of said step-shaped portions, each of said two vertical cover parts having a recess at the respective adjacent step-shaped portion, said recess being adapted to receive a closing plate with holes therethrough for connecting screws, a dummy strip corresponding in its dimensions substantially to the dimensions of said closing plate and detachably inserted into said recess, screw means detachably holding said dummy strip in said recess, and covering means covering up said dummy strip toward the outside and being at least approximately flush with the adjacent surface of the respective adjacent step, said cover parts having holes therein threadedly engaged by said screw means, the axes of said holes corresponding to the axes of the holes in the closing plate, said two vertical cover parts and the respective adjacent step-shaped portions of said lining being provided with aligned blind holes for receiving hinge bolts, said blind holes being closed toward the outside of said lining and said vertical cover parts prior to receiving hinge bolts.

3,925,935

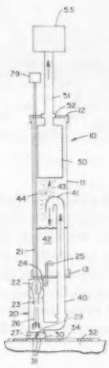
ABRADING SYSTEM

Robert U. Ricklefs, Box 2050, Pebble Beach, Calif. 93953

Continuation-in-part of Ser. No. 452,950, March 20, 1974, abandoned. This application Aug. 28, 1974, Ser. No. 501,026

Int. Cl.² B24C *3/06, 3/32, 7/00*

U.S. Cl. 51—8 HD 3 Claims



1. Apparatus for continuously rendering the floors of bathtubs slip-resistant by abrading a predetermined portion of the floor with a stream of recycling, abrasive granules and recovering spent granules comprising:

an elongated, cylindrical cannister means forming an enclosed supply of abrasive granules

casing means forming an abrading zone positionable adjacent to said predetermined portion of the surface,

aspirating means adjacent to said cannister means for drawing abrasive granules from said cannister means and propelling them against said predetermined portion of said surface in the abrading zone;

exhaust means comprising an exhaust line extending from said casing means to the interior of said cannister means and a vacuum source connected by a vacuum line to the interior of said cannister means for applying a vacuum to said exhaust line;

filter means in the interior of said cannister means; and

said cannister means, casing means, exhaust means, filter means and aspirating means being combined into a single, elongated and generally cylindrical unitary structure whereby the device may be used near the walls of said bathtub.

3,925,936

LAPPING MACHINE

Petr Nikolaevich Orlov, ulitsa M. Ulyanovoi, 21, korpus 2, kv. 54; Jury Ivanovich Nesterov, ulitsa Moldagulovoi, 28, korpus 4, kv. 19, both of Moscow; Vasily Yakovlevich Kudashov, ulitsa Komsomolskaya 22 E, kv. 30; Alexandr Vasilievich Zimnyakov, ulitsa Schelkovichnaya, 184, kv. 12, both of Saratov; Irina Nikolaevna Ermakova, Scherbakovskaya ulitsa, 58a, kv. 38, Moscow; Igor Vasilievich Bogomolov, ulitsa Koltsovskaya, 38, kv. 29, Voronezh; Efim Matveevich Nirman, Piskarevsky prospekt, 24, kv. 73, and Vladimir Dmitrievich Sokolov, prospekt Shvernika, 10, kv. 42, both of Leningrad, all of U.S.S.R.

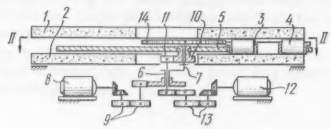
Continuation of Ser. No. 435,998, Jan. 23, 1974, abandoned. This application Jan. 20, 1975, Ser. No. 542,266

Int. Cl.² B24B *5/00, 29/00, 9/00*

U.S. Cl. 51—118 4 Claims

1. A lapping machine for a two-side lapping of flat surfaces of workpieces, comprising a fixed disk lapping tool having a

central axis, cages in which the workpieces are placed and brought into contact with the working surface of the lapping tool, the cages having axes, a first drive for simultaneously rotating the cages with the workpieces around the central axis of the lapping tool and the axes of the cages, said drive including a shaft eccentric with respect to the central axis of the lapping tool, a sun wheel rigidly mounted on said shaft, said cages having planet gears meshing externally with said sun wheel, and operably connected by a gear train with a main



drive rotating the cages and eccentric shaft around the axis of the lapping tool and around the axes of the cages, a flat disk parallel to the lapping tool, sockets in said disk, said cages being placed in said sockets coaxially to the eccentric shaft, a second drive, a central gear located on the axis of the lapping tool operably connected to said flat disk and a train of replacable gears with said second drive for imparting rotation to the flat disk together with the cages around the axis of the eccentric shaft.

3,925,937

COPYING MACHINE TOOLS

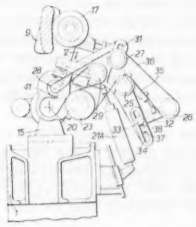
Arthur Royden Stevens, Torquay, and Ronald Forrester Cartwright, Exminster, both of England, assignors to Centrax Limited, Devon, England

Filed Feb. 5, 1974, Ser. No. 439,730

Claims priority, application United Kingdom, Feb. 8, 1973, 6256/73

Int. Cl.[2] B24B *21/02*, *21/12*, *17/02*

U.S. Cl. 51—145 R 9 Claims



1. In a belt grinding machine for grinding a profiled surface of a workpiece, including a supporting structure, means carried by said supporting structure and mounting a cam having a profiled surface and a workpiece for movement in synchronism, a member also carried by said supporting structure and relatively movable toward and away from said profiled surfaces of said cam and said workpiece, a follower mounted on said movable member for engagement with said profiled surface of said cam, biasing means connected between said movable member and said supporting structure for pressing said follower against said profiled surface of said cam, an abrasive belt, belt supporting means carried by said movable member for supporting and driving said abrasive belt to remove material from said profiled surface of said workpiece under the control of said cam, said belt supporting means including a belt contact wheel around which said abrasive belt passes and by which said abrasive belt is pressed against said profiled surface of said workpiece, the improvement comprising:

further mounting means carrying said belt contact wheel, said further mounting means being movable relative to said driving means toward and away from said profiled surface of said workpiece;

stop means carried by said movable member and limiting the movement of said further mounting means relative to said movable member in the direction towards said profiled surface of said workpiece; and

yielding means connected between said further mounting means and said movable member for urging said further mounting means to carry said belt contact wheel and said abrasive belt in the direction towards said profiled surface of said workpiece, said yielding means being incapable of transmitting to said further mounting means the whole of the force applied to said movable member by said biasing means;

whereby said follower is held in engagement with said profiled surface of said cam by said biasing means even in the event that said belt contact wheel and said abrasive belt encounter resistance from said profiled surface of said workpiece, said yielding means yielding to permit movement of said further mounting means and said belt contact wheel relative to said movable member in the direction away from said profiled surface of said workpiece.

3,925,938

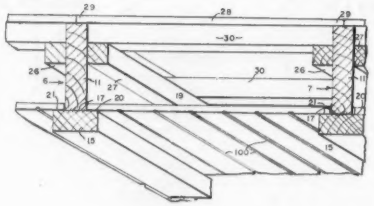
COMPOSITE BUILDING STRUCTURE

Ronald L. Molen, Salt Lake City, Utah, assignor to Research Homes, Inc., McLean, Va.

Filed Oct. 24, 1972, Ser. No. 299,694

Int. Cl.[2] E04B *7/02*, *5/52*

U.S. Cl. 52—22 10 Claims



1. A composite building structure which comprises, in combination, a pair of spaced beams each comprised of a first tension member of dimension lumber firmly secured to the bottom edge of a second wider compression member of dimension lumber, at least one additional compression member of dimension lumber and of substantial compressive strength firmly secured to a side face of the second member along a line spaced from the upper free edge of said second member and projecting towards the other beam of said pair of beams, and a panel member supported by its marginal edges on the said upper free edge of the second member, said panel member being further supported indirectly by the further or additional compression member secured to the same second member, the strength of the said beams being such that the spacing between them and the width of the panel supported by them are substantially greater than in conventional practice.

3,925,939

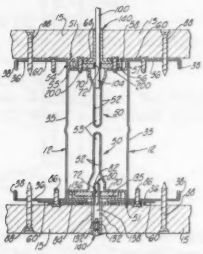
SUPPORT STRUCTURE FOR SHELVING

Peter Costruba, Pico Rivera, Calif., assignor to Angeles Metal Trim Co., Los Angeles, Calif.

Division of Ser. No. 292,093, Sept. 25, 1972, Pat. No. 3,848,364, which is a division of Ser. No. 48, Jan. 2, 1970, Pat. No. 3,714,748. This application Feb. 28, 1974, Ser. No. 446,742

Int. Cl.[2] A47F 5/00

U.S. Cl. 52—36 4 Claims



1. A device adapted to be attached to a pair of elongated C-shaped studs having their main webs spaced from one another for adjustably receiving a support bar between said webs, comprising:

an elongated upstanding interlock member adapted to be positioned generally in alignment with the studs between their spaced main webs and having flanges for attaching said member to each of said studs, said interlock member defining a shallow vertical channel extending longitudinally of said interlock member adapted to be located in the space between said webs to adjustably receive a support bar therein, said interlock member further defining an inward elongated vertical passage behind said vertical channel; said flanges being oriented in directions transverse to the direction of elongation of said vertical passage and having portions which extend beyond said vertical channel for receiving fasteners adapted to fasten said interlock members to said studs at positions exterior of said vertical channel;

said passage having a U-shaped closed end extending longitudinally of said interlock member, said closed end forming one extremity of said interlock member;

an elongated support bar positioned in said vertical channel having a slot communicating with said inward vertical passage; and

anchoring means adapted to anchor said support bar in said vertical channel.

3,925,940

BUILDING

Harry P. O'Connell, Jr., and Eugene E. Hopster, both of El Cajon, Calif., assignors to Donn H. Gross

Filed July 24, 1972, Ser. No. 274,495

Int. Cl.[2] E04B 1/32

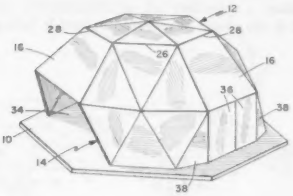
U.S. Cl. 52—81 7 Claims

1. A geodesic type building having a self-supporting shell, said shell comprising:

an equilateral hexagonal roof sub-assembly unit having the peripheral edges thereof horizontal, and

three hexagonal wall sub-assembly units in upstanding tripod arrangement, the lowermost edges thereof being coplanar and horizontal and together defining the base plane of the building, and the upper edges thereof being secured to alternate edges of said roof sub-assembly unit; and

three trapezoidal panels each having one edge secured to an edge of said roof sub-assembly unit between two of said wall sub-assemblies and having two opposing edges secured to adjacent edges of said two wall sub-assembly units;



all of said units being of identical planform.

3,925,941

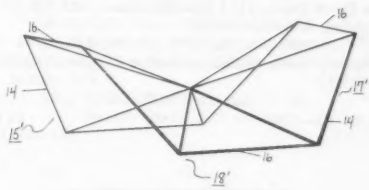
MODULAR CURVED SURFACE SPACE STRUCTURES

Peter J. Pearce, Studio City, Calif., assignor to Synestructics, Inc., Chatsworth, Calif.

Division of Ser. No. 216,488, Jan. 10, 1972, abandoned. This application May 13, 1974, Ser. No. 469,415

Int. Cl.[2] E04B 1/32

U.S. Cl. 52—82 16 Claims



1. A saddle-like polygonal surface module for defining, in conjunction with other, related modules, space enclosing structures, the module comprising:

a nonplanar, skew polygonal periphery, having straight edges and a plurality of linear strut members extending from each junction of said straight edges at the periphery forming a fully triangulated interior framework to define a saddle-like structural module,

said polygonal periphery having six edges, one pair of opposing edges and an included edge defining a first plane, a second pair of opposing edges and an included edge defining a second plane; the interior angles of the edges defining said first and second planes being 120°, said first and second planes intersecting at a dihedral angle of 125° 16′, the edges at said intersection of planes joining at 90°.

3,925,942

MODULAR STRUCTURE FORMED OF INTERCONNECTED TUBULAR MEMBERS

Richard J. Hemmelsbach, West Olive, Mich., assignor to Space Age Industries, Inc., Grand Haven, Mich.

Filed Nov. 12, 1973, Ser. No. 414,952

Int. Cl.[2] E04B 1/32, 7/02

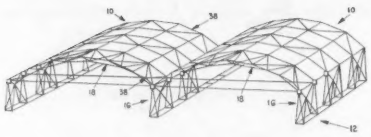
U.S. Cl. 52—86 16 Claims

1. A modular structure comprising:

a pair of vertical support towers spaced apart and defining the sides of the modular structure, each support tower comprising a base formed of interconnected tubular members and support struts extending upwardly from the base so as to form a pair of upper corners spaced apart a pre-determined distance, each said tower further comprising reinforcing means that interconnect the base and the support struts so as to maintain the upper corners of

the tower in a fixed position relative to the base of the tower; and

a section of a domed roof mounted on and extending between the support towers, said section of domed roof comprising a plurality of interconnected truss units formed in the shape of inverted pyramids having rectangular bases, said truss units being formed of tubular members connected together at the ends thereof, with the truss units being connected together along common sides of their bases, the truss units on each end of the domed roof section being mounted on the upper corners of the tower such that one side of the base of each such truss unit extends between the upper corners of the tower.



3,925,943
PORTABLE STRUCTURAL FRAMING MEMBER

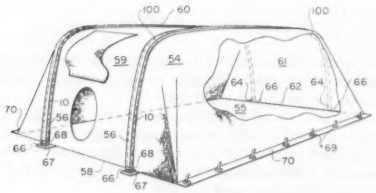
John David Petrie, 1112 Manulife House, 603-7th Ave. SW., Calgary, Alberta, Canada

Filed Sept. 30, 1974, Ser. No. 510,863

Claims priority, application United Kingdom, Oct. 2, 1973, 182482/73

Int. Cl.² E04H *12/18*

U.S. Cl. 52—108 11 Claims



1. A structural member capable of being coiled by bending said member in one direction and being uncoiled by bending said member in the opposite direction to form a frame member which is relatively rigid except when said frame member is bent in said one direction, said structural member comprising an elongated one-piece body member of suitably flexible material, said body member having a passageway extending lengthwise therethrough and having transverse cuts distributed along the length thereof, each cut extending inwardly from one side of the body member and having a bottom near but spaced apart from the opposite side of the body member, said body member being divided into member segments by said cuts with each member segment being joined to an adjacent member segment by a relatively thin, flexible joint, and sheer members of suitably strong material fitted securely in said passageway, a first portion of one sheer member being disposed in each of said member segments and the remaining portion of said one sheer member protruding from one end of the member segment in which said first portion is disposed, said remaining portion extending into the passageway of the adjacent member segment when the structural member is uncoiled, said sheer members thereby absorbing sheer forces at adjacent ends of adjacent member segments.

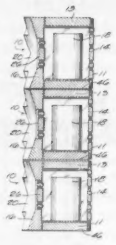
3,925,944
NICHES

Robert Paul Pickel, New Berlin, Wis., assignor to Conrad Pickel Studios, Inc., New Berlin, Wis.

Continuation-in-part of Ser. No. 362,630, May 21, 1973, abandoned. This application Sept. 13, 1974, Ser. No. 505,711

Int. Cl.² E04H *13/00*

U.S. Cl. 52—134 7 Claims



1. In a building having a window opening in an exterior wall thereof, the improvement comprising an assemblage of box-shaped niches positioned adjacent to each other within said window opening, each niche having side walls and having a bottom, urn means for the ashes of a deceased person supported on the bottoms of at least some of said niches, the inner end of each niche forming a receiving opening, a light-transmitting inner end panel removably fitted to the inner end of each container to close said receiving opening, there being an outer end panel for each niche which includes light-transmitting elements for admitting light from the exterior to said niche to pass therethrough through the light-transmitting inner end panel, the light-transmitting means at at least one of said ends forming a decorative window, the size of said urn means being minor with respect to the interior of the niche so as to allow space for the passage of light through the niche, said niches completely filling said window opening so that said inner end panels taken together serve as a large decorative window, the urn means of each niche being flat and fitted to the niche to form the bottom thereof, leaving a clear space thereabove for passage of light through the niche, and the inner surface of at least one of the side walls of the niche being provided with a special light-reflecting surface of a type which substantially enhances the reflection of light.

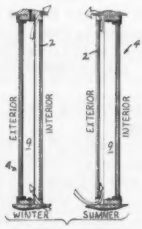
3,925,945
HEAT EXCHANGER WINDOW

Walter S. White, 833 Old Dutch Mill Road, Colorado Springs, Colo. 80904

Filed Nov. 23, 1973, Ser. No. 418,606

Int. Cl.² E06B *7/12*; E04B *2/28*

U.S. Cl. 52—171 3 Claims



1. A transparent insulating building panel reversibly mounted for positioning commensurate with the outside temperature, comprising:

a frame pivotally mounted in the plane of a wall of said building,

a pane of tinted heat absorbing glass mounted within said frame,

a pair of spaced apart glass panes mounted within said frame and in air tight engagement therewith, said pair of panes mounted in spaced relation and parallel to said pane of heat absorbing glass, and

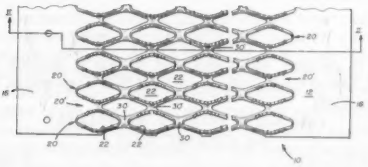
aperture means in said frame providing an unrestricted path of air flow through the space between the heat absorbing glass and the said pair of panes.

3,925,946

RETICULATED GRATING

Henry A. Balinski, Hoffman Estates, and Albert F. Kuhr, Elk Grove Village, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Nov. 16, 1973, Ser. No. 416,481
Int. Cl.² E04C *2/42*; E04F *11/16*
U.S. Cl. 52—180 **9 Claims**



1. In a grating including a sheet having opposite surfaces and apertures therein, said apertures being defined by side walls, each said side wall extending transversely across the sheet to opposite edge portion which are spaced apart by a distance greater than the thickness of said sheet, the side wall edge portions projecting from at least one of said sheet surfaces being provided with serrations thereon to reduce slippage over the sheet;

the improvement wherein at least alternate serrations are each twisted through an angle with respect to the plane of the edge portion of the aperture, the resulting structure being so arranged that each of said serrations is skewed with respect to the next adjacent serration of that edge portion whereby slippage over the sheet is further reduced.

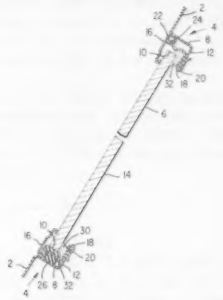
3,925,947

AUTOMOBILE WINDOW SEALING

Robert M. Meyers, Fairless Hills, Pa.; Edward F. Kutch, Trenton, and Matthew M. Sitter, Convent Station, both of N.J., assignors to Novagard Corporation, Trenton, N.J.

Continuation of Ser. No. 266,076, June 26, 1972. This application Jan. 25, 1974, Ser. No. 436,451
Int. Cl.² E04B *1/62*; E06B *3/00*
U.S. Cl. 52—208 **11 Claims**

1. An automobile window assembly comprising a pinch weld member surrounding the opening in which the window is to be located and presenting an outwardly facing surface, a pane of glass closing said opening and supported about its edges by the outwardly facing surface of said pinch weld member, there being a hot melt elastomeric sealing composition disposed between said edges of said pane of glass and the outwardly facing surface of said pinch weld member throughout the entire periphery of the pane of glass, said sealant composition being characterized by the fact that it is fluid at a temperature above about 150°F so that upon contact thereof with the surface of the glass and pinch weld member while at such temperature it will establish a fluid-type contact with both the glass and pinch weld member, said sealing composition consisting essentially of a nonreactant mechanical mixture of from about 10 to 200 parts by weight of an elastomeric polymer, from about 1 to 200 parts by weight of tackifying resins, from about 10 to 400 parts by weight of plasticizer, from about 0.5 to 60 parts by weight of one or more adhesion promoters, and from about 5 to 500 parts by weight of inert



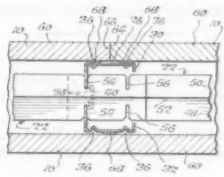
filler, said sealing composition further being characterized by the fact that upon cooling to atmospheric temperature, it will have a hardness of from about 20 to 95 on a Shore A Durometer.

3,925,948

MODULAR WALL CONSTRUCTION

Gale E. Sauer, Williamsville, and Barton G. Hansen, Cheektowaga, both of N.Y., assignors to Roblin Hope's Industries, Inc., Buffalo, N.Y.

Filed Nov. 1, 1973, Ser. No. 411,703
Int. Cl.² E04B *2/30*, *2/60*
U.S. Cl. 52—481 **2 Claims**



1. Means supporting opposed panel members in a double wall comprising at least two vertical studs spaced longitudinally along the length of said double wall; each said stud comprising an elongated body member of generally channel U-shaped cross sectional configuration providing a web portion and a pair of opposite side walls in substantial parallelism with each other and extending in a direction normal to said web portion; said web portion having a plurality of longitudinally spaced openings formed therein with each of said openings having a uniform radius and an uninterrupted periphery; at least one elongated spacer bar extending between said studs and having opposite ends projecting through aligned openings of said studs; said spacer bar having diverging legs with a pair of slots at each said end extending inwardly from the longitudinal edges thereof and being in planes substantially perpendicular to the longitudinal axis of said spacer bar, the longitudinal axes of the slots of each pair being aligned, each pair of said slots being mounted over the lower peripheral edge portion of each corresponding said opening to lock each respective end of said spacer bar in a locked axial position, and opposed panel members defining opposed wall surfaces; each of said stud side walls defining a bearing surface receiving the edge portions of side-by-side related panel members thereon.

3,925,949
STRUCTURAL MEMBER AND METHOD OF MAKING THE SAME

Tom T. Mikulin, 1469 Bellevue Ave., Burlingame, Calif. 94010

Filed Sept. 30, 1974, Ser. No. 510,480
Int. Cl.² E04H *12/00*
U.S. Cl. 52—581 8 Claims

1. The method of forming an elongated structural member comprising the steps of:

providing a section of said member comprising a plurality of rectangular sidewalls swingably secured together about longitudinally extending parallel axes,

providing a second similar section in end to end relation with said first section and securing the adjacent ends of said sections together,

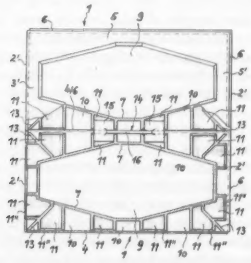
arranging the sidewalls of both sections by swinging the same about said axes to form a prism of a length equal to the length of both sections and with the opposite parallel free edges of the two outer sidewalls of said plurality of both sections in engagement, and thereafter,

connecting said free edges of both sections together.

3,925,950
BUILDING BLOCK ASSEMBLY

Jurgen von der Ley, Rothelteich 41, D-5828 Ennepetal 14, Germany

Filed June 4, 1974, Ser. No. 476,256
Claims priority, application Germany, June 16, 1973, 2330772
Int. Cl.² E04C *1/14, 1/42*
U.S. Cl. 52—585 5 Claims



1. In a building block assembly, a building block having a four-sided frame and a panel surrounded by the frame; each frame side having longitudinally extending, parallel-spaced legs and an interconnecting floor together defining an outwardly open, generally U-shaped cross section, wherein the improvement comprises in combination:

a. a rib-and-shoulder formation provided on an outer zone of each leg on each side of the frame; the shoulders of the rib-and-shoulder formation on two adjoining sides of the frame being oriented towards one another; the shoulders of the rib-and-shoulder formation on the other two adjoining sides of the frame being oriented away from one another;

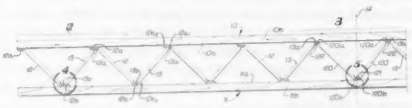
b. a plurality of outwardly open, tubular sockets disposed centrally between the two legs of each frame side on the interconnecting floor and connected to the legs by transverse bridge members; said sockets being distributed along the length of each frame side; the distance between any adjoining two sockets in one frame side being twice the distance of an outermost socket from the adjacent end of the frame; each socket has a terminal edge that is recessed with respect to said outer edges of the legs; and

c. a removable and reinsertable coupling member conforming in shape to each socket opening for being received by the socket.

3,925,951
TRUSSED JOIST

Edgar D. Jackson, Alta Loma, and Thomas E. Jackson, Upland, both of Calif., assignors to Steel Web Corporation, Alta Loma, Calif.

Filed Aug. 5, 1974, Ser. No. 494,414
Int. Cl.² E04C *3/292*
U.S. Cl. 52—693 8 Claims



1. In a trussed joist, the combination comprising

a. upper and lower chord members extending in generally the same longitudinal direction and in spaced apart relation,

b. metallic tubular webs extending in zig-zag configuration in the space between the chord members, each web having opposite ends which are flat, one end of each web extending proximate the inner side of the upper chord member and the other flat end of each web extending proximate the inner side of the lower chord member, the ends of successive webs extending in overlapping relation,

c. said webs including tension webs extending diagonally upwardly and longitudinally toward an end of the joist, and compression webs extending diagonally downwardly and longitudinally toward an end of the joist, the tension web ends extending flatly against the inner sides of the chord members,

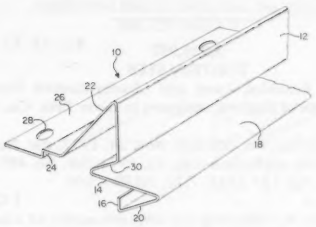
d. said tension web ends including first portions overlapped by compression web ends, and second portions extending longitudinally substantially beyond said compression web ends, and there being certain fasteners projecting through both the compression web ends and the tension web end first portions and into the chord member, and other fasteners projecting only through the tension web end second portions and into the chord members and in offset relation to both the certain fasteners and said compression web ends.

3,925,952

PANEL SUPPORT AND ATTACHMENT SYSTEM

John Louis Hagel, Hinsdale; Robert Carl Pape, Hanover Park, and Ernest William Reinwall, Jr., McHenry, all of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 25, 1974, Ser. No. 454,644
Int. Cl.² E04B 1/38
U.S. Cl. 52—714 21 Claims



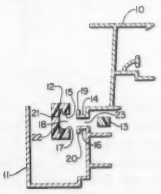
1. A system for securing one extremity of a panel to an edge portion of a support structure, the system including, a horizontal alignment means cooperating with and connected to a vertical alignment means lying in planes generally perpendicular to one another, a shelf portion extending outwardly from the plane of the vertical alignment means at a predetermined vertical position on the system and on one side of the plane of the vertical alignment means with the horizontal alignment means extending on the opposite side of the plane of the vertical alignment means, a panel attachment and vertical support surface extending in a plane generally perpendicular to that of the horizontal alignment means and located above the predetermined vertical position of the shelf portion, the aligment means, shelf portion and panel attachment surface all being interconnected wherein the system may be secured to the edge portion of the support structure and is adapted to subsequently receive and secure a panel thereto.

3,925,953

METHOD OF MAKING A THERMAL BREAK CONSTRUCTION ELEMENT

Joseph N. LaBorde, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 458,823, April 8, 1974, abandoned, which is a continuation of Ser. No. 286,315, Sept. 5, 1972, abandoned. This application Mar. 24, 1975, Ser. No. 561,242
Int. Cl.² E04B 1/64; E06B 1/32
U.S. Cl. 52—741 10 Claims



1. A method of making a unitary thermal break construction element comprising two lineal metal members and two lineal plastic locking elements, the latter comprising a clamp and a wedge, comprising the steps of:

a. aligning a pair of lineal metal members in a spaced apart parallel relationship, each of said metal members having a recessed portion therein extending the length thereof for receiving an end portion of a lineal plastic clamp, and said metal members being so aligned with each other that said recessed portions are also aligned with each other in a spaced apart parallel relationship and opposite each other;

b. positioning a lineal plastic clamp on said metal members, said plastic clamp having a pair of oppositely facing end portions thereon adapted to be received by the recessed portions in said metal members, and said plastic clamp being so positioned on said metal members that one end portion thereon is received by a recessed portion in one metal member and the other end portion thereon is received by a recessed portion in the other metal member; and

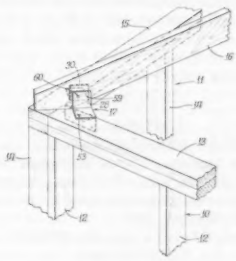
c. inserting a lineal plastic wedge into an opening between the two metal members and between the recessed portions therein thereby locking the plastic clamp on the metal members and forming a unitary thermal break construction element.

3,925,954

CORNER BRACKET WITH HIP SADDLE

Kenneth T. Snow, 1303 N. Cross St., Wheaton, Ill. 60187, and Kenneth T. Snow, Jr., 317 Shagbark Court, Schaumburg, Ill. 60172

Filed Sept. 24, 1973, Ser. No. 400,009
Int. Cl.² F16B 7/00
U.S. Cl. 52—752 3 Claims



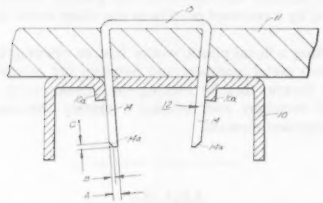
1. A building corner bracket with a hip saddle for wood framed buildings of the type having walls disposed at right angles to one another and each wall having vertically disposed spaced apart wooden studs with adjoining wooden top plates, comprising an angled member with vertical side walls disposed at right angles to one another, a horizontally extending diagonally disposed bridge member spanning the inside space between the vertical side walls of the angled member and acting to reinforce the spacing of the vertical side walls, said bridge member integrally fastened to and located at the top of the angled member, a pair of angle members having horizontal and vertical sides, said horizontal sides integrally joined to the top side of the bridge member in spaced apart relationship, and each angle member having a portion of its horizontal side extending beyond the vertical side walls of the angled member and lying generally in the same plane as the bridge member and acting as top flanges adapted to lie on the top surface of the adjoining wooden top plates, and the vertical sides of the pair of angle members together with the bridge member acting as a saddle adapted to receive a roof hip rafter whereby the vertical sides of the pair of angle members are adapted to abut opposite sides of the roof hip rafter.

3,925,955

STAPLE FOR LIGHT GAUGE METAL PIERCING

Carl T. Becht, Cincinnati, Ohio, assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Aug. 16, 1973, Ser. No. 388,893
Int. Cl.[2] F16B 5/00, 15/00
U.S. Cl. 52—758 D 2 Claims



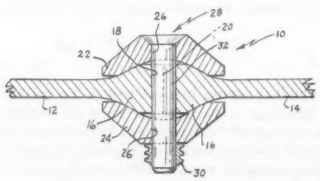
1. A structure comprising an element secured to a piece of light gauge sheet metal by means of a staple comprising a drivable U-shaped wire member having legs terminating in piercing ends, the legs of said staple, at their piercing ends, having their outside surfaces beveled, leaving partial blunt points, the length of said bevels axially of said legs being at least about 50% of the wire size and the angle of said bevels being such as to remove between about 25% and about 50% of the wire size at the points, in the "as driven" condition of said staple said legs passing through said element and said piece of light gauge sheet metal securing said element and said light gauge sheet metal piece together in abutting relationship, tabs of said sheet metal being bent down along and bearing against the outsides of the legs of said staple, and the legs of said staple converging toward each other.

3,925,956

FATIGUE RESISTANT SPLICE

Lester M. Atkinson, Marietta; Carroll R. Bigham, Dunwoody, and James L. Peed, Marietta, all of Ga., assignors to The United States of America as prepresented by the Secretary of the Air Force, Washington, D.C.

Filed July 22, 1974, Ser. No. 490,600
Int. Cl.[2] F16B 5/06
U.S. Cl. 52—758 D 2 Claims



1. In a splice for fastening in fixed relationship with respect to one another a pair of aircraft wing panels which undergo both forces of compression and tension, the improvement therein comprising a pair of edge-abutting wing panels, an edge of each of said panels being transversely enlarged, each of said enlarged edges gradually increasing in size toward said edge over a longitudinal distance of more than twice the thickness of said wing panel and terminating at a thickness of substantially twice the thickness of the remainder of said panel whereby the stress concentrations produced thereon are both evenly and gradually distributed in the panel, said enlarged edge of each of said panels being in direct contact with one another, at least one semi-circular cut out located within said enlarged edge of each of said panels thereby forming at least one complete aperture along the area of contact of said edges of said panels, a pair of securing elements matingly engaging and mounted about said enlarged edges of said panels, the mating surface of each of said securing elements being a distance from said edges in excess of the thickness of said remainder of each of said wing panels, at least one hole located within each of said securing elements in alignment with said aperture in said edges of said panels, and means passing through said aperture in said wing panels and said hole in said securing means fixedly securing said panels together.

3,925,957

TOOTHPASTES

Susan Mary Venables, Ascot, and Charles Andrew Watson, Ruislip, both of England, assignors to Lever Bros. Co., New York, N.Y.

Division of Ser. No. 309,535, Nov. 24, 1972, Pat. No. 3,878,938. This application Aug. 23, 1974, Ser. No. 499,815
Int. Cl.[2] A61K 7/22; A45D 40/00
U.S. Cl. 53—6 1 Claim

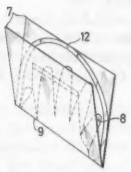
1. A process for inhibiting the corrosive action of a toothpaste containing chloroform on unlacquered aluminum tubes comprising incorporating in said toothpaste an effective corrosion-inhibiting amount of a substance selected from the group consisting of urea, biuret, gelatine, benzoic acid and soluble salts of benzoic acid, said effective amount of urea and gelatine being within the proportions of about 0.1% to about 10%, and said effective amount of biuret, benzoic acid, and soluble salts of benzoic acid being within the proportions of about 0.5% to about 10%, by weight of said toothpaste, and packing said toothpaste containing said corrosion-inhibiting substance in an unlacquered aluminum tube.

3,925,958

METHOD OF PRODUCING AND PACKAGING GLOVES FORMED OF THERMOPLASTIC FOIL

Wilhelm Heisig, Pahlstr. 12, Munich, Germany (55)

Filed July 5, 1973, Ser. No. 376,807
Int. Cl. B65b 11/48
U.S. Cl. 53—21 FW 7 Claims



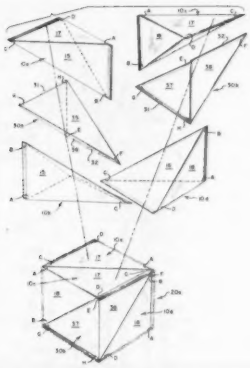
1. Method of producing and packaging gloves formed of thermoplastic material by severing from two superimposed foil sheets of thermoplastic material disposed on a paper web respective portions of the foil sheets each corresponding to half of a glove, welding together the corresponding edges of the glove-half portions except for respective edge portions which define an opening for sliding a hand into the thus-formed glove, and then subdividing the paper web into sections at locations between the individual thus-formed gloves, the improvement therein which comprises folding over once the subdivided paper sections together with the respective, thus-formed glove adhering thereto, and heating opposite marginal portions of the folded paper sections while the remainder of the thermoplastic material portions severed from the foil sheets remain disposed therebetween to form a welding seam.

3,925,959

TETRAHEDRAL PACKAGING MEANS AND METHOD OF MAKING SAME

Ralph E. Dykes, White Plains, N.Y., and Robert M. Mitchell, South Norwalk, Conn., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 683,047, Sept. 22, 1967, which is a division of Ser. No. 420,646, Dec. 23, 1964, Pat. No. 3,347,363. This application Dec. 6, 1971, Ser. No. 205,433
Int. Cl.² B65B *9/08*
U.S. Cl. 53—28 10 Claims



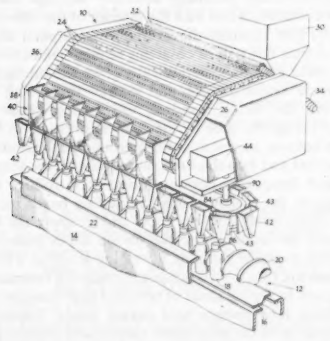
1. A package comprised of a plurality of product-enclosing containers, said package having a rectangular three-dimensional outline, each of said containers being generally of an irregular tetrahedral shape, each face of each container being in the general configuration of a right triangle, said containers being oriented in face-to-face relationship within said package with the long edge of the container extending throughout said package and between two diagonally opposed corners thereof.

3,925,960

ARTICLE COUNTING AND FILLING MACHINE

George W. Saari, Westminster, and Ronald L. Belliveau, Fitchburg, both of Mass., assignors to The Lakso Company, Incorporated, Fitchburg, Mass.

Filed Apr. 18, 1974, Ser. No. 462,107
Int. Cl.² B65B *57/20*
U.S. Cl. 53—78 1 Claim



1. In a machine for filling containers with discrete articles comprising

a series of elongated slat members, means supporting said slat members for movement in a closed path in a direction generally transverse to the lengths thereof, at least some of said slat members having outer surfaces with a multiplicity of spaced apart cavities therein, said path including spaced apart cavity charging and discharging stations, means at said charging station for depositing articles in said cavities, the outer surface of each slat member tilting at said discharge station to discharge simultaneously all articles from the cavities therein,

a first set of article-guiding chutes disposed in side-by-side relation, each chute positioned to receive articles discharged from a predetermined number of the cavities of each slat member when it reaches said discharge station, each chute having an upper inlet and a lower outlet,

a second set of article-guiding chutes, disposed beneath said first set of chutes, each chute of said second set having an upper inlet of predetermined size and a lower outlet which is smaller than the inlet,

container delivery means for delivering containers along a container path which passes beneath chutes of said second set, and

drive means for driving said container delivery means and said slat members,

the improvement wherein,

means are provided for supporting said second set chutes for movement in a closed loop having a loop portion that extends the full length of said slat members, said loop portion being in vertically spaced alignment with said first set of chutes, each said second set chute inlet having a leading edge and a trailing edge spaced apart by a distance greater than the corresponding dimension of any first set chute outlet,

said drive means are connected to drive said delivery means continuously to provide a continuous uniform speed of container movement along said container path and to drive said second set chutes in synchronism with said containers at said uniform speed, whereby, as each chute traverses said loop portion, its outlet is in vertically spaced alignment with a container mouth, said drive means arranged to drive said slat members at a rate dependent upon said uniform speed and in synchronism with said second set of chutes so that discharge of articles at said discharge station occurs only when each second set chute is positioned to receive articles from a first set chute outlet.

3,925,961

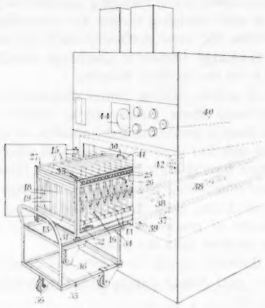
DEVICE FOR PACKAGING AND PRESERVING STERILIZED PRODUCTS UNDER VACUUM IN PLASTIC PACKS, IN PARTICULAR LINEN

Maurice Orliaguet, Sucy en Brie, France, assignor to M.A.J., Pantin, France

Continuation-in-part of Ser. No. 348,527, April 6, 1973, abandoned. This application Dec. 4, 1974, Ser. No. 529,295
Int. Cl.² B65B *31/02*
U.S. Cl. 53—89 9 Claims

1. Device for packaging and preserving sterilized products under vacuum in plastic packs, in particular linen, in an autoclave, comprising at least one parallelepipedical support-rack, rails along the upper longitudinal edges of said rack, baskets suspended in this rack, packs in the form of bags of air-impervious plastics bags open at their upper end and carried by said baskets, horizontal and transverse parallel bars provided at their ends with rollers rolling along the rails of the rack, vertical side arms firmly attached to said bars, scissor-type members bracing said arms, members for compressing and sealing the open ends of packs fixed above said arms, means for

introducing the support racks loaded with filled packs into the autoclave, and in the autoclave connecting members for compressed air and electricity to said compressing and sealing members of the racks.



3,925,962

APPARATUS FOR COMPACTING CONTENTS OF CONTAINERS

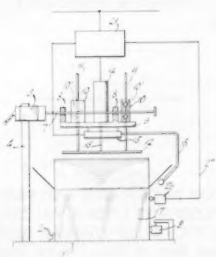
Werner Knopf, and Harald Liebscher, both of Dresden, Germany, assignors to VEB Kombinat Nagema, Germany

Filed Sept. 3, 1974, Ser. No. 502,997

Claims priority, application Germany, Dec. 11, 1973, 175247

Int. Cl.² B65B *1/24*

U.S. Cl. 53—124 B **10 Claims**



1. Apparatus for compacting the contents of an open top container which comprises the base for supporting the bottom of a container, a carriage supporting a press plate, means in said carriage for guiding said press plate for vertical movement towards and away from said base to compact the contents of the container disposed on said base, means for moving said press plate vertically in said means for guiding, means for shifting said carriage horizontally, said carriage being mounted for sliding movement along guide rails, said guide rails in turn being mounted for sliding movement along guide bars disposed orthogonally to said guide rails and wherein said guide bars are mounted for vertical adjustment.

3,925,963

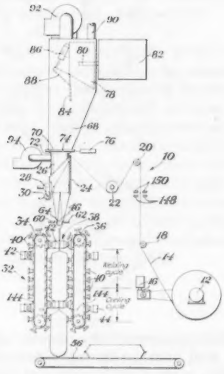
FORM, FILL AND SEAL INDUSTRIAL BAG MACHINE

Eddie Lee Greenawalt, and Lorenzo Dow Geren, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 347,923, April 4, 1973, abandoned. This application Apr. 15, 1974, Ser. No. 460,864

Int. Cl.² B65B *9/08*

U.S. Cl. 53—182 **32 Claims**

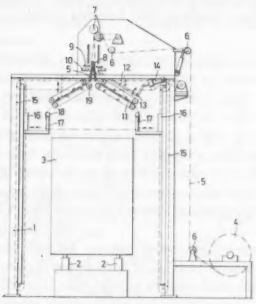


1. Apparatus adapted particularly for forming industrial size bags from continuous thermally sealable web materials, and for simultaneously filling and sealing the bags in-line as they are formed, said apparatus comprising: a hollow tube former for converting the web into an upwardly open vertical tube having its marginal edges overlapped, a filling mandrel suspended downwardly generally centrally through the tube former for communication with the interior of the tube, means to integrally join together the overlapped marginal edges of the tube, at least one pair of co-acting sealing heads, means to move the sealing heads to periodically grasp the tubing across the transverse extent thereof, and to draw the tubing downwardly from the filling mandrel, the sealing heads being adapted to clamp the tube by mechanical pressure to form a temporary bottom, means to dump a product load through the filling mandrel and into the tube subsequent to the formation of each such temporary bottom, means to introduce heated welding gas to the sealing heads, the sealing heads including means to transversely part the tube, and to apply the heated gas generally preferentially to the parted edges thereof, said sealing heads together defining a welding space in which the parted edges are free from mechanical clamping restraint, said welding space including areas of retarded heat transfer conditions residing intermediate said parted edges, respectively, and the portions of the tube under mechanical clamping pressure by the sealing heads, said areas of retarded heat transfer conditions being adapted to prevent the clamped areas of the tube from reaching heat deformation temperatures.

3,925,964
ARRANGEMENT FOR PULLING A TUBE OF HEAT-SHRINKABLE PLASTIC DOWNWARDLY OVER A STACK OF GOODS

Richard Birkenfeld, Sudring, and Friedrich Wieligmann, Sennlich, both of Germany, assignors to Firma E. Mollers, Maschinenfabrik, Beckum, Germany

Filed Dec. 26, 1974, Ser. No. 536,297
Claims priority, application Germany, May 11, 1974, 2422935
Int. Cl.² B65B *43/34*
U.S. Cl. 53—183 **14 Claims**



1. Apparatus for placing a tube of heat-shrinkable plastic over a stack of goods by moving the tube over the goods, the tube is originally supplied flattened in a roll with longitudinally extending pleating sides extending along the flattened side of the tube, the apparatus including first means for removing the flattened tube from the roll and partially opening the tube, second means for receiving the partially opened tube from said first means and for opening and spreading the tube, third means for severing a section of the tube and closing the severed end after a partial movement of the tube by said second means, and said second means arranged to move the severed section of the tube over the goods, wherein the improvement comprises that said second means includes conveyor means arranged to receive the partially opened tube at each of its opposite pleated sides from said first means for moving the tube from said first means and for continuing to spread the pleated sides while holding at least a portion of the pleated sides, said conveyor means having an inlet end arranged to receive the partially opened tube from said first means and an outlet end, gripping means located adjacent the outlet end of said conveyor means for engaging the opened end of the tube moving from the outlet end and for spreading the tube to a size sufficient for movement over the goods in contact-free relation therewith, and displacing means associated with said conveyor means and being movably displaceable for withdrawing the pleated portions of the tube from engagement with said conveyor means so that the downward movement of the severed tubular tube section can be completed for movement over the stack of goods.

3,925,965
FUEL ROD PELLET LOADING ASSEMBLY

George E. Rushworth, Richland, Wash., assignor to Exxon Nuclear Company Inc., Richland, Wash.

Filed Jan. 22, 1973, Ser. No. 325,723
Int. Cl. B65b *31/00, 21/06, 57/00*
U.S. Cl. 53—112 R **13 Claims**

1. An assembly for the loading of nuclear fuel pellets into a fuel rod comprising in combination:

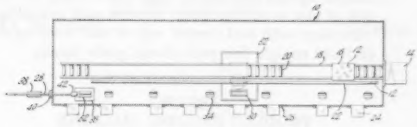
a. a main housing having an inert atmosphere and adapted to receive fuel pellets for loading into fuel rods;

b. a trough of predetermined length for receiving said pellets in end-to-end relationship;

c. a weighing station including balance means for weighing said pellet-loaded trough;

d. means for determining the length of said fuel pellets; and

e. a pellet loader assembly disposed for alignment with said trough and said fuel rod, said trough arranged to longitudinally receive a predetermined load of said fuel pellets for passage from said trough through said assembly into said fuel rod, said pellet loader assembly comprising a tube supporting member and a fuel pellet holder member for longitudinally receiving said fuel pellets from

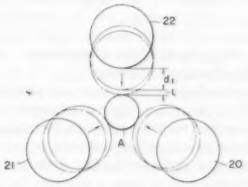


said trough spaced from said tube supporting member to define a gap therebetween, and pellet loading insert means having a first circular pellet entry end and an opposite circular pellet exit end bridging said gap, said insert means carried at said pellet entry end by said fuel pellet holder member and in operable communication and axial alignment with said fuel rod at said pellet exit end for facilitating transfer of said fuel pellets from said pellet holder member into said fuel rod with a minimum amount of chipping of said pellets, said insert means comprising a plurality of spring-like fingers disposed in a circular array and tapered in the direction from said pellet entry end toward said pellet exit end.

3,925,966
COIN PACKAGING APPARATUS

Masatoshi Ushio, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Japan

Filed Jan. 14, 1974, Ser. No. 432,890
Claims priority, application Japan, Jan. 12, 1973, 48-6421
Int. Cl.² B65B *11/04*
U.S. Cl. 53—212 **1 Claim**



1. In a coin packaging apparatus of the type including a coin stacking means for arranging and stacking each of a predetermined number of coins of the same diameter into a neat stack, a plurality of wrapping rolls disposed below said stacking means and arranged annularly in parallel spaced relationship to each other, a guide means movable in a straight line along a path for guiding a stack of coins from said stacking means to a position between said wrapping rolls, means for imparting rotation at least to one of said wrapping rolls and hence to a stack of coins held therebetween, and means for supplying a wrapper between the stack of coins and wrapping rolls as the stack of coins rotates with said wrapping rolls; the improvement comprising:

means connected to said stacking means for selectively adjusting the inside diameter of said stacking means to the diameter of the coins to be stacked therein and for

maintaining the central axis of said stacking means coincident with said straight line path along which said guide means moves; and

means connected to said wrapping rolls for moving, prior to guidance of the coin stack from said stacking means into the wrapping space between said wrapping rolls by means of said guide means, all of said wrapping rolls to a first position spaced from but closely adjacent to the position to be occupied by the peripheral surface of the coin stack in accordance with the diameter of coins to be packaged, and for then moving, after the coin stack has been guided from said stacking means into said position in said wrapping space, all of said wrapping rolls to a second position contacting said coin stack, while maintaining the central axis of said wrapping space between said wrapping rolls coincident with said central axis of said stacking means and said straight line path of said guide means.

3,925,967

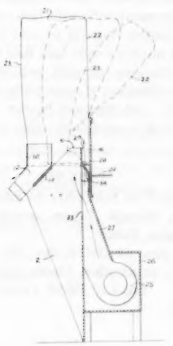
PRODUCT BAGGING MACHINE

Jan Bloemhof, 13336 58th St., Edmonton, Alberta, Canada

Filed June 24, 1974, Ser. No. 482,549

Int. Cl.² B65B *43/36*

U.S. Cl. 53—385 **7 Claims**



1. A product bagging machine comprising:

a slide member having a slide surface;

said slide member having an outlet portion divided into two sections which are outwardly rotatable to a wide position; means associated with the sections for normally drawing them together to a narrow position;

means at the outlet end of the slide surface for supporting a stack of bags;

means for supplying a stream of air at the outlet end of the slide member to open the top bag of the stack; and

means, coacting with the movement of a product advancing along the slide member, for expanding from within the open top bag to hold its mouth portion fully open.

3,925,968

POWER LAWN MOWER AND MULCHER-BAGGER COMBINATION

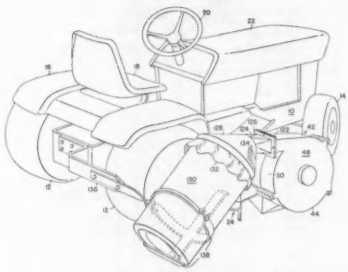
Fred William Wagenhals, Marion, Ohio, assignor to Deere & Company, Moline, Ill.

Filed Mar. 4, 1974, Ser. No. 447,842

Int. Cl.² A01D *49/00*

U.S. Cl. 56—13.3 **3 Claims**

3. In combination with a tractor supporting a rotary mower of the type including an open bottom mower housing having mower blade means disposed therein and adapted to sever material and to impel the severed material along a discharge path defined by a top wall and front and rear vertical walls of the housing and extending in general tangential relationship to the cutting blade means, said path terminating at a discharge opening in the side of the mower housing, a mulcher-bagger attachment comprising: a housing means secured to the mower housing and including baffle means inserted in said discharge opening comprising front and rear portions disposed against said front and rear vertical walls and interconnected by a bottom portion inclined upwardly away from the mower housing; said housing means further including a generally cylindrical portion having transversely spaced end walls and a generally circular, tubular immediate wall joining said end walls; a generally horizontal and transversely extending rotatable drive shaft means extending axially through and supported by said end walls of said housing means; said cylindri-



cal portion having an inlet opening in a lower area thereof and said baffle means leading to said inlet for guiding severed material to the exterior of said housing means; said cylindrical portion having an outlet opening in an upper area of said intermediate wall; rotor means including a mulcher-impeller blade means being mounted on said drive shaft means for rotation therewith for carrying material from said inlet opening to said outlet opening; cutterbar means fixed to said housing means and positioned to cooperate with said mulcher-impeller blade means for recutting material as it is carried by the blade means between said inlet and outlet openings; container means supported on the tractor and including conduit means leading from said outlet opening so as to receive mulched material discharged from said housing means; and drive means connected to said drive shaft means for rotating the latter.

3,925,969

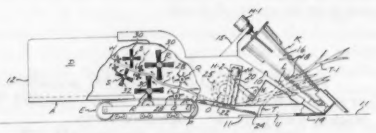
SUGAR CANE HARVESTING MACHINE

Okamura Shunichi, 108 Kamoike Bldg., No. 2691, Korimoto, Kagoshima, Japan

Filed Dec. 20, 1973, Ser. No. 426,946

Int. Cl.² A01D *45/10*

U.S. Cl. 56—13.9 **12 Claims**



1. A device that may be used by a single operator to harvest and defoliate sugar cane growing on raised elongate laterally separated ridges of earth both when said sugar cane is standing upright and when in bent positions, said device including:

a. a vehicle assembly that comprises

1. an elongate frame that includes two laterally separated sidewalls that have forward and rearward ends;
2. an engine supported from said frame;
3. two rotatable laterally spaced supporting members that straddle one of said ridges and support said frame thereabove, with said supporting members driven by said engine;
4. a seat for said operator supported from said frame;
5. defoliated sugar cane receiving means disposed in a fixed position relative to said frame adjacent said rearward ends of said sidewalls;
6. first, second, third, fourth, fifth and sixth power means supported from said frame;
7. manually operable control means adjacent said seat to permit said operator to selectively control the speed of rotation of said supporting members to guide said vehicle and the operation of said first to sixth power means inclusive;

b. first rotatable means rotatably supported in fixed positions adjacent said forward ends of said sidewalls and driven by said first power means, said first rotatable means engaging said sugar cane as said device moves forwardly to raise sugar cane to a first position;

c. a horizontal push bar that occupies a fixed position adjacent said forward ends of said side walls for moving upright sugar cane and sugar cane that has been raised to said first position to a second position where said sugar cane may be cut;

d. rotatable cutting means driven by said second power means that is supported from said frame rearwardly of said push bar, said cutting means including at least one disk slightly inclined to the horizontal, and said disk rigidly supporting a plurality of circumferentially spaced cutter blades that not only cut said sugar cane adjacent the ground but direct the cut sugar cane rearwardly relative to said sidewalls;

e. second rotatable means for removably engaging sugar cane cut by said rotatable cutting means and minimizing the tendency of said sugar cane to move laterally as said sugar cane moves rearwardly relative to said sidewalls;

f. a horizontal roller resiliently and rotatably supported between said sidewalls above said cutting assembly and driven by said third power means and cooperating with said cutting assembly and said second rotatable means to guide said sugar cane that has been cut rearwardly relative to said sidewalls with minimum lateral movement;

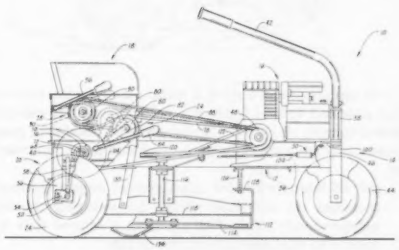
g. cut sugar cane supporting means disposed between said sidewalls and rearwardly of said second rotatable means;

h. a pair of first horizontal vertically spaced rollers that are concurrently driven by said fourth power means to have adjacent portions of said rollers move rearwardly, said first pair of rollers rotatably supported between said sidewalls rearwardly of said supporting means, with said first pair of rollers of such structure as to resiliently grip cut sugar cane of varying diameters therebetween, and said first pair of rollers moving said sugar cane passing therebetween rearwardly at a first speed;

i. a pair of second horizontal, vertically spaced, brush supporting rollers that are concurrently driven by said fifth power means to have adjacent portions of said rollers move rearwardly, said second pair of rollers having said cut sugar cane discharge therebetween from said first pair of rollers, said second pair of brush supporting rollers defoliating said cut sugar cane moving rearwardly therebetween due to the differential in the circumferential speed of said second pair of rollers to the rearward longitudinal speed of said sugar cane; and

j. a pair of third horizontal, vertically spaced brush supporting rollers that are concurrently driven by said sixth power means to have adjacent portions of said rollers move rearwardly and that receive the cut defoliated sugar cane therebetween from said second pair of brush supporting rollers, said third pair of brush supporting rotatably supported between said sidewalls rearwardly of said second pair of brush supporting rollers, said third pair of brush supporting rollers rotating at a speed substantially less than that of said second pair of brush supporting rollers, and said third pair of rollers moving said cut defoliated sugar cane rearwardly at a speed that is such that said cut defoliated sugar cane will drop to said defoliated sugar cane receiving means by gravity when freed from said third pair of brush supporting rollers.

3,925,970
LAWNMOWER
Easborn Rusco, 211 Westwood, Manhattan, Kans. 66502
Filed June 24, 1974, Ser. No. 482,000
Int. Cl.[2] A01D *35/26*
U.S. Cl. 56—14.7 **5 Claims**



1. In a power-driven vehicle, having a frame, a power means mounted on the frame, and a steering wheel means pivotally mounted on the frame, the improvement comprising:

a. a drive wheel means having a pair of drive wheels individually mounted on drive wheel mounts pivotally mounted on the frame, said drive wheel mounts individually pivotable in a downward direction from a driving position to a disengaged position; said drive wheel mounts secured to an axle and said axle has said drive wheels freely rotatably mounted thereon;

b. a steering means connected individually to each of said drive wheel mounts with a pair of cables, said cable on the side toward which the vehicle is to be turned disengaging said drive wheel mount on that side;

c. a powered drive shaft means having a drive shaft rotatably mounted on the frame and having end portions extending therefrom, said end portions having friction means mounted thereon to frictionally engage said drive wheels when said drive wheels are in a driving position;

d. a forward drive means having a variable speed pulley mounted on said drive shaft, a first idler pulley mounted on the frame, a first drive belt connecting said variable speed pulley, first idler pulley, and the power means, and a first lever means connected to said first idler pulley to engage said first idler pulley when in use;

e. a reverse drive means having a drum portion being part of said variable speed pulley, a second idler pulley mounted on the frame and adjacent to said drum portion, and a second drive belt connecting said second idler pulley and the power means, and a second lever means connected to said second idler pulley to engage said second drive belt with said drum portion when in use; and

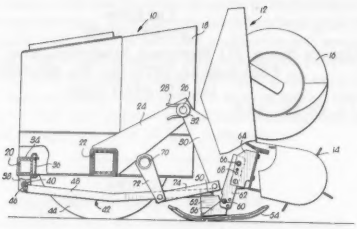
f. said drive shaft operatively connected to the power means, the vehicle being constructed and adapted to in operation when said steering means is turned, said drive wheel on the inside of the turn is disengaged from said drive shaft, and both of said drive wheels engaged with said drive shaft when the vehicle is not turning.

3,925,971

GAUGING APPARATUS FOR IMPLEMENT HEAD

Lowell J. Goering, Moundridge, and Ferol S. Fell, Newton, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Mar. 15, 1974, Ser. No. 451,365
Int. Cl.² A01D 67/00
U.S. Cl. 56—208 3 Claims



1. In an implement having a mobile main frame and a crop head attached to said frame for vertical swinging movement relative thereto about a first generally horizontal axis, gauging apparatus at least partially supporting said head and comprising:

a pair of laterally spaced apart ground engaging members mounted on said main frame for swinging movement independently of said head about a second axis in response to rises and falls in the terrain,

said second axis being generally horizontal and being spaced rearwardly from said first axis; and

structure disposed between said members and the head for transmitting vertical motion from said members to the head as terrain variations are encountered whereby to shift the head in a direction to compensate for such variations,

said members having a common support frame extending rearwardly therefrom and said support frame having a single pivotal coupling with said main frame at said second axis,

said support frame including a transversely extending, rigid crossbar fixed at its opposite ends to said members and a pair of rigid, rearwardly extending legs leading from said crossbar at longitudinally spaced locations thereon,

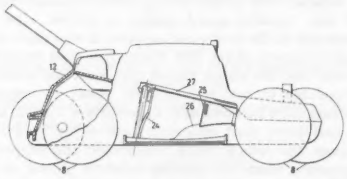
said single pivotal coupling of the support frame with the main frame being adjacent the rearmost ends of said legs and being spaced inwardly from said ground engaging members.

3,925,972

LAWN MOWER WITH A SIDE OUTLET

Kjell Arne Andersson, Huskvarna, Sweden, assignor to Husqvarna AB, Huskvarna, Sweden

Filed June 14, 1974, Ser. No. 479,531
Int. Cl.² A01D 67/00
U.S. Cl. 56—320.2 1 Claim



1. A rotary lawn mower comprising:

a chassis;

wheels supporting said chassis;

a rotor housing formed in said chassis;

a cutting blade rotatably supported in housing;

a motor means operatively associated with said blade for rotating same;

said rotor housing having an open bottom, having a height increasing successively around said motor means, and portions of said housing defining a side outlet for expulsion of cut grass including front, rear, upper and lower edges;

a pair of flap members pivotably attached respectively to said front and rear edges of said outlet and movable between a closed position in which they cover said outlet and an opened position in which they expose said outlet, said flap members being restricted in their movement away from said outlet to form a shield in their opened position against objects which are thrown by said blade through said outlet;

a cover plate hingedly attached to said upper edge of said outlet for locking said flap members in their closed position; and

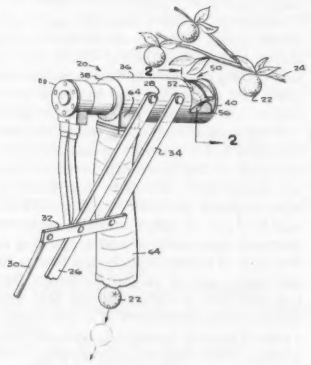
said lower edge extending upwardly over the forward portion of said outlet limiting the height of said outlet at said forward portion relative to the height of said outlet at the rearward portion thereof.

3,925,973

FRUIT PICKING APPARATUS

George M. Glover, Merritt Island, Fla., assignor to Caroline J. Starkey, Merritt Island, Fla.

Filed Nov. 19, 1974, Ser. No. 525,197
Int. Cl.² A01D 46/24
U.S. Cl. 56—328 R 11 Claims

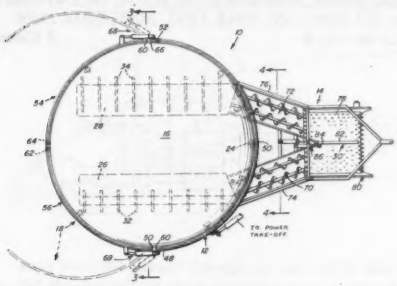


1. A fruit harvester for harvesting fruit from a tree comprising in combination, an elongated spiral member, support means supporting said elongated spiral member for rotation about its axis, means defining a fixed abutment extending transversely adjacent said elongated spiral member, drive means for drivingly rotating said elongated spiral member about its axis in direction so that positioning of an unharvested fruit member inwardly of the outer periphery of said spiral member between said spiral member and said fixed abutment results in movement of the fruit member past the fixed abutment to harvest the fruit member from the tree.

3,925,974
HAYSTACKER

Morton P. Bartlett, 700 North Main, Chadron, Nebr. 69337

Filed Mar. 26, 1974, Ser. No. 455,038
Int. Cl.² A01D 87/00
U.S. Cl. 56—346 14 Claims

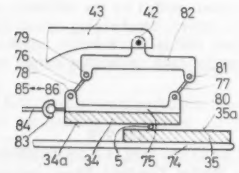


1. A haystacker, comprising, in combination:
a. an enclosure;
b. feed means for pushing hay into the enclosure; and
c. packer means associated with the enclosure for packing hay in the enclosure to a predetermined tension, the enclosure having a bed, and the feed means includes a trough provided in the bed and arranged opening into the enclosure, and further including unloading means for removing packed hay from the enclosure, the feed means having a plurality of troughs provided in the bed and arranged opening into the enclosure, and further including diverter means for alternately forcing hay into the troughs.

3,925,975
APPARATUS FOR PIECING A THREAD IN AN OPEN-END SPINNING UNIT

Fritz Stahlecker, Josef-neidhart-Strasse 18, D 7341 Bad Ueberkingen, and Hans Stahlecker, Haldenstrasse 20, D 7334 Suessen, both of Germany

Filed Oct. 10, 1974, Ser. No. 513,775
Claims priority, application Germany, Oct. 10, 1973, 2350844
Int. Cl.² D01H 7/00, 1/12, 15/00
U.S. Cl. 57—34 R 20 Claims

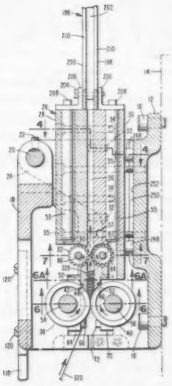


1. Apparatus for piecing a thread end in an open-end spinning unit having a spinning rotor with a ring of opened-up fibers comprising:
a clamping device containing a first clamping member, and a second clamping member,
first clamp control means for moving said clamping members toward and away from one another to effect clamping and unclamping of a portion of said thread end therebetween,
second clamp control means for moving said clamping members with respect to one another in a direction transverse to the longitudinal direction of said portion of said thread end while said portion of said thread end is clamped between said clamping members to effect at least partial elimination of the spinning twist in said thread end,
and a device for returning the thread end into the spinning rotor after said partial elimination of the spinning twist.

3,925,976
METHOD AND APPARATUS FOR TEXTURING CONTINUOUS FILAMENT YARN

Alexander L. Trifunovic, Wilmington, Del.; William H. Hills, Melbourne; Milton H. Borgman, Satellite Beach, both of Fla., and Emory P. Mersereau, Wilmington, Del., assignors to Indian Head, Inc., New York, N.Y.

Filed June 1, 1973, Ser. No. 366,200
Int. Cl.² D02G 1/12
U.S. Cl. 57—140 R 14 Claims



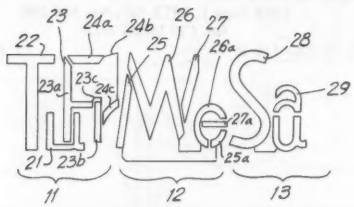
1. A method of texturing continuous filament yarn having a denier in the range of approximately 40–150, said method comprising:
feeding said yarn into a confined crimping zone against a mass of crimped yarn therein causing the yarn to collapse longitudinally and fold over forming crimps which become part of said mass, said mass in said crimping zone being in the form of a core of crimped yarn having a substantially rectangular transverse cross-section, the ratio of the shortest dimension of said cross-section in inches to the denier of said yarn having a minimum value of about 0.000667;
applying heat and pressure to said crimped yarn mass in said crimping zone to plastically deform the yarn and partially set said crimps;
feeding said crimped yarn mass from said crimping zone to a setting zone;
applying heat and pressure to said crimped yarn mass in said setting zone to fully set said crimps, the pressure applied to said mass in said setting zone being substantially only sufficient to keep said crimps closed;
feeding said crimped yarn mass from said setting zone to a cooling zone;
cooling said crimped yarn mass in said cooling zone to a temperature below the temperature at which the yarn undergoes any molecular structural alteration in the absence of the application of a substantial force thereto; and withdrawing the yarn in continuous filament form from said cooling zone.

14. A crimped yarn product produced by the method recited in claim 1.

3,925,977
DISPLAY SYSTEM FOR SHOWING THE DAYS OF THE WEEK IN AN ELECTRICAL TIMEPIECE

Shuji Maezawa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 354,417, April 25, 1973, abandoned. This application Mar. 18, 1974, Ser. No. 452,317
Claims priority, application Japan, May 2, 1972, 47-44022
Int. Cl.[2] G04B 19/24; G09D 3/00; G09B 13/00
U.S. Cl. 58—4 A 3 Claims

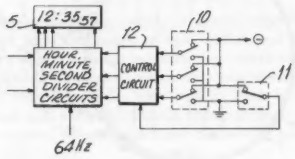


1. A display system in a timepiece for showing each of the days of the week in the form of the corresponding initial two letters, said display system being electrically activated, comprising three groups of letters, said first group of letters consisting of an S and an *a* to the right of said S, the letter *a* being horizontally divided into two segments so that activation of the lower segment presents the letter *u* and activation of both segments presents the letter *a*, said letter S being electrically connected with said lower segment of said letter *a* for activation together, said second group of letters consisting of a first subgroup of segments including a left segment, a middle segment and a right segment, activation of said left segment and said middle segment forming an M and activatiaon of said middle segment and said right segment forming a W, and a second subgroup of segments to the right of said first subgroup of segments, said second subgroup including an upper left segment, a lower right segment and a middle horizontal segment, activation of said lower right segment and said upper left segment presenting the letter *o*, and activation of all three segments in said second subgroup forming the letter *e*, said left segment in said first subgroup being electrically connected with said lower right segment in said second subgroup, said middle segment in said first subgroup being electrically connected with said upper left segment in said second subgroup, and said right segment in said first subgroup being arranged for simultaneous electrical activation with said horizontal segment of said second subgroup connected with said horizontal segment in said second subgroup, and a third group of letters consisting of a T, and a *u* to the right of said T, a long vertical bar having a horizontal arm extending rightward therefrom at approximately the mid-point thereof, said long vertical bar having lower and upper ends and being positioned with its lower end within the vertical legs of said *u*, a horizontal bar having a left end positioned with its left end proximate the upper end of said long vertical bar, a short vertical bar positioned to the right of said *u* and a curved bar in an angled position to the right of said short vertical bar, said long vertical bar and said horizontal bar forming an F, said long vertical bar and said short vertical bar forming an *h* and said short vertical bar with said curved angle bar forming an *r*, said long vertical bar and said short vertical bar being electrically connected and said horizontal bar and said curved angled bar being electrically connected, said first group thereby being adapted for presenting Sa and Su, said second group being adapted for presenting Mo and We, and said third group being adapted for presenting Tu, Th and Fr, whereby the initial two letters of all days of the week may be presented.

3,925,978
TIME CORRECTING ARRANGEMENT FOR ELECTRONIC WRIST WATCHES

Okito Naito, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed July 31, 1973, Ser. No. 384,339
Claims priority, application Japan, July 31, 1972, 47-76697
Int. Cl.[2] G04C 3/00; G04B 19/30, 27/00; H03B 19/00
U.S. Cl. 58—23 R 5 Claims



1. An electronic timepiece comprising oscillator circuit means for producing a high frequency time standard signal; frequency divider means for dividing said high frequency time standard signal to produce a plurality of low frequency timekeeping signals; display means for the digital display of time including a display element associated with each said timekeeping signal to be displayed; electronic control circuit means coupled to said divider means; means for providing a correction signal directly coupled to said control circuit means; at least one manually operable time correction switch, each said correction switch being associated with a displayed timekeeping signal to be corrected, each time correction switch being directly coupled to said control circuit means for the selective application of said correction signal through said control circuit means to the divider means for the selective correction of the count of the associated displayed timekeeping signal to be corrected upon the manual actuation of said correction switch; and a manually operable multi-position safety switch directly coupled to said control circuit means, said control circuit means isolating each correction switch from said divider means to prevent selective application of a correction signal by actuation of any of said correction switches when said safety switch is in a first position, and said control circuit means effecting a transmission of a correction signal through said control circuit means and to the divider means in response to actuations of each of said correction switches for effecting time correction of the displayed timekeeping signal associated with the actuated correction switch when said safety switch is in a second position whereby the time standard signal applied by the oscillator means to said divider means to provide timekeeping signals to be displayed is not interrupted during the selective application of said correction signal by each correction switch to the divider means.

3,925,979
ANTI-ICING SYSTEM FOR A GAS TURBINE ENGINE

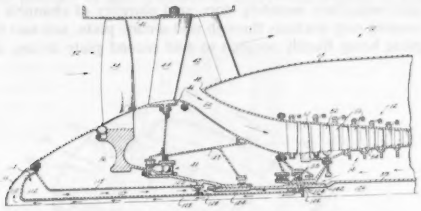
Walter Herbert Ziegler, Topsfield, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Oct. 29, 1973, Ser. No. 410,759
Int. Cl.[2] F02G 3/00; B64D 15/00; F01D 5/08, 29/08
U.S. Cl. 60—39.07 8 Claims

1. In a gas turbine engine having a bullet nose, a compressor, a combustor, and at least one turbine arranged in serial flow relation together with at least one seal continuously pressurized by compressed airflow bled from the compressor and a hollow shaft driven by a turbine, there is also included an anti-icing system comprising:

a plenum contiguous with the inside surface of the bullet nose for receipt of a portion of the compressed airflow bled from the compressor after the compressor bleed airflow has been utilized for seal pressurization,

first conduit means for ducting the compressed bleed airflow from the pressurized seal to the plenum, and second conduit means for ducting the compressed bleed airflow



away from the plenum through the bore of the shaft and out the downstream end thereof into the ambient airstream.

3,925,980

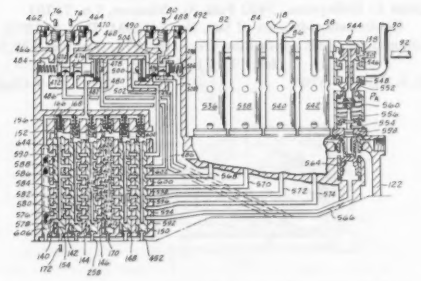
CONTROL APPARATUS PARTICULARLY FOR A PLURALITY OF COMPRESSOR BLEED VALVES OF GAS TURBINE ENGINE

Howard L. McCombs, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Division of Ser. No. 289,404, Sept. 15, 1972, Pat. No. 3,848,636. This application July 22, 1974, Ser. No. 490,624

Int. Cl.² F02C *9/14*

U.S. Cl. 60—39.29 **7 Claims**



1. Gas turbine engine compressor air bleed control apparatus comprising:

a plurality of first valve means operatively connected to said compressor for venting pressurized air from selected stages thereof;

fluid pressure responsive control means operatively connected to each of said first valve means for actuating the same;

a first source of pressurized fluid;

a second source of pressurized fluid at a lower pressure relative to said first source;

conduit means communicating said first source of pressurized fluid with said control means;

a plurality of second valve means operatively connected to said conduit means in series flow relationship for venting the same to said second source of pressurized fluid depending upon the relative positions of said second valve means; and

second control means responsive to a variable condition of engine operation operatively connected to each of said plurality of second valve means for actuating the same independently of the remaining valve means.

3,925,981

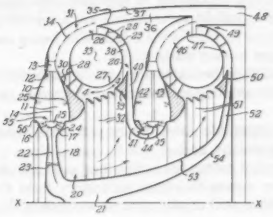
GAS GENERATOR

Alexander Hossen Etessam, 91 Eldorado Ave., Shemiran, Tehran, Iran

Filed June 24, 1974, Ser. No. 482,664

Int. Cl.² F02K *7/02, 7/04, 7/06*

U.S. Cl. 60—39.77 **22 Claims**



1. A gas generator comprising:

a plurality of annular combustion chambers arranged in at least one pair disposed on a common central axis,

the combustion chambers of each pair being of the same volume, co-extensive and adjacent, having air inlets and exhaust outlets,

a common annular air inlet passage leading to said air inlets of the combustion chambers of each said pair,

a primary exhaust passage leading commonly from the exhaust outlets of the combustion chambers of each said pair,

an exhaust duct communicating with said exhaust passage, fuel injection means and ignition means for each combustion chamber,

means for operating at least one of said fuel injection means and ignition means of each pair of combustion chambers alternately at least during start-up whereby the paired combustion chambers operate in an alternate cycle,

an air intake passage,

means for transferring energy from high velocity exhaust gasses emitted by each pair of combustion chambers to cooler, lower velocity gas from said air intake passage so as to establish a combined gas stream of resultant energy, a secondary exhaust passage,

means for separating part of said combined stream consisting substantially of combustion products into said secondary exhaust passage,

a diffuser for collecting and diffusing part of said combined stream consisting substantially of air and conducting it to said air inlet passage of a said pair of combustion chambers whereby each air inlet passage receives high pressure air from a said diffuser,

said combustion chambers of each pair converging directly and without individual scavenging means into said primary exhaust passage in the form of mutually inductive nozzles whereby the combustion chambers operate in pulses in alternate sequence with the ignition cycle in one chamber creating a reduced pressure in the other chamber thereby assisting the air intake.

3,925,982

FLUID-DYNAMIC SHOCK RING FOR CONTROLLED FLOW SEPARATION IN A ROCKET ENGINE EXHAUST NOZZLE

Heinz E. Mueller, Littleton, Colo., assignor to Martin Marietta Corporation, New York, N.Y.

Filed Sept. 11, 1973, Ser. No. 396,261

Int. Cl.² F02K *1/14, 1/18, 9/02*

U.S. Cl. 60—242 **1 Claim**

1. In a rocket engine main nozzle having throat and divergent sections for the expansion and discharge of a main thrust producing gas stream, said nozzle section having a large area

ratio; means for injecting at launch and thereafter a low mass secondary fluid radially interiorly of the nozzle and about the full circumference thereof to form at least one fluid-dynamic shock ring to force the boundary layer of said main gas stream to separate uniformly from the nozzle wall, the improvement comprising:

said means for injecting a secondary fluid interiorly of said nozzle wall being plural in number, axially spaced at positions corresponding to specified area ratio,

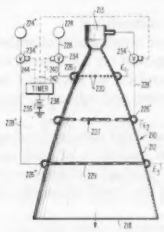
an annular manifold surrounding each injecting means on the exterior surface of the nozzle wall being sealed at both side edges to said wall,

a source of fluid provided for each injection means,

means fluid coupling said source respectively to each manifold,

selectively operable valve means provided within said fluid coupling means, and

timer operated means for controlling said selectively operable valve means to effect secondary fluid flow sequentially within said axially spaced secondary fluid injecting



means in order from said throat at times corresponding to specific rocket altitude such that flow initiated in the immediately succeeding secondary fluid injecting means after terminating in the immediately proceeding secondary fluid injecting means, such that the boundary layer separates uniformly from the nozzle wall at succeedingly downstream positions corresponding to said specified area ratios at corresponding rocket altitude under rocket engine launch conditions,

and wherein, each secondary fluid injecting means is provided with a separate supply of secondary fluid of a mass such that the flow of secondary fluid to a given secondary fluid injecting means terminates automatically in response to the rocket engine reaching the altitude corresponding to the flight point wherein the next secondary fluid injecting means in said sequence is to receive secondary fluid under control of said timer operated means such that valve opening is initiated by said timer operated means during secondary fluid injection in said given sequence to provide boundary layer separation at specified area ratios corresponding generally to rocket altitude.

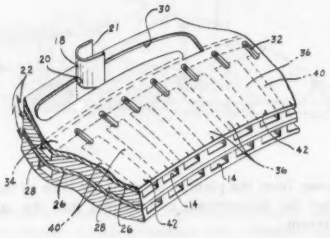
3,925,983

TRANSPIRATION COOLING WASHER ASSEMBLY

Richard J. LaBotz, Fair Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 17, 1974, Ser. No. 461,670
Int. Cl.² F02K *11/02*
U.S. Cl. 60—265 **4 Claims**

1. In a transpiration cooled device having a washer assembly and means for delivering coolant to said washer assembly operatively connected thereto, the improvement therein comprising a washer assembly having at least a first and second plate, said first plate having a primary metering slot of a predetermined size and at least one secondary metering slot therein, said primary and secondary metering slots extending completely through said first plate, said second plate having an aperture located therein capable of being operatively aligned with said primary metering slot in a plurality of positions, said aperture being of a size less than said predetermined size of said primary metering slot, a plurality of channels formed in said second plate operatively connected to said primary and said secondary metering slots, said plurality of channels extending only partially through said second plate, and said first plate being fixedly secured to said second plate in any of a



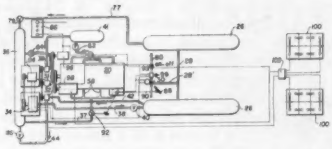
number of predetermined positions with respect thereto thereby permitting different effective lengths of said primary metering slot, whereby coolant is delivered from said delivery means to said primary metering slot, from said primary metering slot to one of said channels, from there to said second metering slot and onto said remaining channels wherefrom said coolant is distributed in such a manner as to cool said device.

3,925,984

COMPRESSED AIR POWER PLANT

John E. Holleyman, 3402 Polk St., Monroe, La. 71201

Continuation-in-part of Ser. No. 419,551, Dec. 5, 1973, abandoned. This application Dec. 10, 1974, Ser. No. 530,561
Int. Cl.² F15B *11/06*
U.S. Cl. 60—370 **9 Claims**



1. A noxious exhaust-gas-free compressed air power plant for vehicles comprising, in combination, a piston and cylinder type engine having a drive shaft; manifold means for admitting equally highly compressed air to and discharging it from each of the cylinders of said engine to effect reciprocation of the pistons and rotation of the shaft; low and high pressure compressed air tanks; a battery powered compressor for compressing air and delivering it to said tanks; and a battery powered high pressure pump manually actuatable upon a drop in pressure in said high pressure tank to further compress air from said low pressure tank, and deliver it to said high pressure tank for delivery to said engine manifold means.

3,925,985

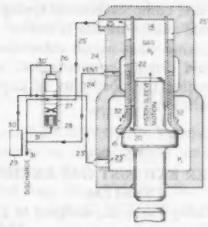
IMPACT ACTUATOR

Carl R. Peterson, Boxford, Mass., assignor to Rapidex, Inc., Gloucester, Mass.

Filed Jan. 9, 1973, Ser. No. 322,110
Int. Cl.² F01L *25/06;* **F01B** *7/18*
U.S. Cl. 60—371 **19 Claims**

1. In an actuator capable of delivering repeated impacts to a variable, stopped position comprising the combination of an impact member movable back and forth relative to said posi-

tion, an expansible drive for driving said member toward said position while expanding, and a return for returning said impact member and recompressing said drive, said return including a follower which follows said impact member to its variable stopped position and a hydraulic system enabled by said position of said follower to apply return force to said



impact member, the improvement wherein said hydraulic system includes a hydraulic drive for said follower in the following direction, a valve separate from said follower and impact member effective to direct said flow alternately to drive said follower in following direction and drive said impact member in its return direction and a control for actuating said follower drive upon said driving of said impact member.

3,925,986

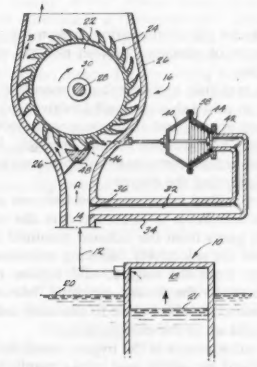
AIR ENGINE

William M. Barwick, Rte. 5, Box 234, Washington, N.C. 27889

Filed July 8, 1974, Ser. No. 486,646

Int. Cl.² F03B *13/12*

U.S. Cl. 60—398 **4 Claims**



1. In an air engine for utilizing power generated by the rise and fall of ocean tides, having a tidal chamber with an interior space in which pressure is created during the rise of the tide and in which a partial vacuum is created during the fall of the tide, a turbine connected to a power output and disposed in an inlet which is in communication with the interior space, and a valve disposed in the inlet between the turbine and the tidal chamber, the improvement comprising:

a valve control mechanism having an inlet conduit in communication with the tidal chamber upstream from the turbine, an air tight chamber in communication with the conduit and having a diaphragm member forming at least a portion of a wall of the chamber, an actuating rod connected at one end to the diaphragm member and an opposite end connected to the valve, whereby when air pressure increases in the tidal chamber due to a rising tide the diaphragm and actuating rod will be moved in one direction so as to move the valve to cause operation of the turbine by impingement of the air going out of the tidal chamber thereon, and whereby when air pressure decreases in the tidal chamber due to a lowering tide the diaphragm will be moved in an opposite direction so as to move the valve to cause operation of the turbine by impingement of the air going into the tidal chamber thereon.

3,925,987

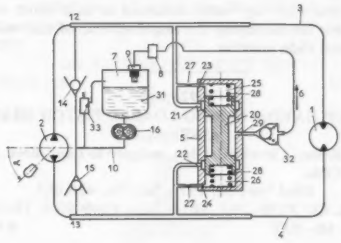
HYDRAULIC CONTROL CIRCUIT

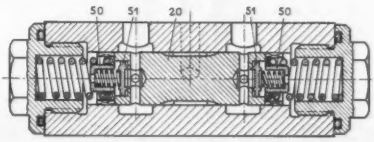
Jacques Faisandier, 32, Bd Felix Faure, 92 Chatillon-sous-Bagneux, France

Continuation of Ser. No. 295,531, Oct. 6, 1972, abandoned, which is a continuation of Ser. No. 81,721, Oct. 19, 1970, abandoned. This application Nov. 18, 1974, Ser. No. 524,483

Int. Cl.² F15B *21/04*

U.S. Cl. 60—464 **3 Claims**





1. A hydraulic control circuit for delivering pressurized fluid to a load comprising:

reversible pump means, said pump means having a discharge port commensurate with each flow direction;

first conduit means for connecting each of said pump means discharge ports to the load, said first conduit means cooperating with said pump means and the load to define a main flow path;

means for treating fluid extracted from said conduit means;

means connected between said treating means and said first conduit means for returning the treated fluid under pressure to the main flow path; and

valve means connected between said first conduit means and said treating means for extracting fluid from the first conduit means connected to the pump means discharge port having the instantaneously lower pressure, said valve means including:

a valve body, said body defining a chamber;

a slide member positioned in said chamber, said slide member being characterized by at least two spaced lands, said lands dividing said chamber into an intermediate chamber portion and two distal chamber portions;

means including an exit port in said valve body for providing fluid communication between said intermediate chamber portion and said treating means;

means including spacially spaced inlet ports in said valve body for providing fluid communication between respective of said first conduit means and said valve body de-

fined chamber, said inlet ports being positioned so as to be closed by said slide member lands and to be alternately opened by movement of said slide member to establish a flow path through said intermediate chamber portion between one of said inlet ports and said means providing fluid communication between said intermediate chamber portion and said treating means;

means for resiliently biasing said slide member to an intermediate position wherein said inlet ports are closed by said slide member lands;

second conduit means providing communication between a first distal portion of the valve body chamber and a point which is in communication with the main flow path defined by said first conduit means at a first side of the load; a first one-way valve mounted in said second conduit means for modifying the response time of said resiliently biased slide member;

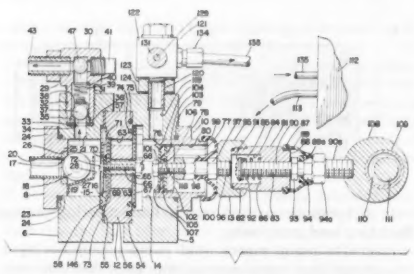
third conduit means providing communication between the second distal portion of the valve body chamber at a point which is in fluid communication with the main flow path defined by said first conduit means at a second side of the load; and

a second one-way valve mounted in said third conduit means for modifying the response time of said resiliently biased slide member.

3,925,988
PUMP HAVING SPRING-LOADED PISTON SHAFT ASSEMBLY

Zar W. Kelley, Cleveland, Ohio, assignor to Louis Beck, Cleveland, Ohio

Filed Nov. 30, 1973, Ser. No. 420,662
Int. Cl.[2] F15B 7/02; F01B 3/00; F04B 9/08, 19/00
U.S. Cl. 60—539 **4 Claims**

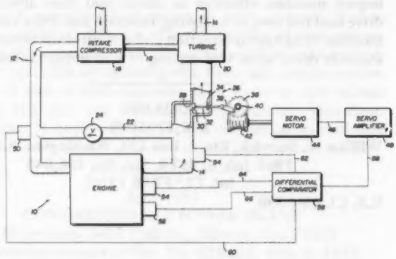


1. In a pump, means including a first housing portion defining a fluid driving compartment, means including a second housing portion defining a driven fluid compartment, valve-controlled means for introducing fluid into said fluid driving compartment, piston means in said fluid driving compartment having a suction stroke in response to which said valve-controlled means is opened to cause said fluid to pass into said fluid driving compartment, said valve being of a size such that intake of said fluid into said fluid driving compartment is so restricted that on the suction stroke of said piston means, said piston means cannot completely fill said fluid driving compartment with sufficient rapidity to avoid cavitation in said fluid driving compartment, and means for preventing significant cavitation in said fluid driving compartment, said last-named means comprising a stem extending axially from said piston means, a body removably secured to the outer end of said stem, said body comprising a portion having an axial bore which is counterbored to provide a hollow chamber in said body, the junction of said bore and chamber forming a shoulder, a piston shaft slidably mounted in said axial bore and having a portion extending into said chamber and provided at one end with an abutment, a compression coil spring interposed between said abutment and said shoulder for resiliently biasing said piston shaft toward said stem, and means for causing reciprocal movement of said piston shaft, whereby on the suction stroke of said piston means, said piston shaft is first retracted through said axial bore, so that said compression coil spring is compressed while said piston means remains in a forward position relatively to said piston shaft, the pressure of said compression coil spring being less than atmospheric pressure, so that when said compression coil spring expands to its initial condition, said piston means is drawn back, thereby substantially eliminating what would otherwise have been a vacuum in said fluid driving compartment, and, in effect, substantially eliminating the possibility of cavitation in said fluid driving compartment.

3,925,989
TURBOCHARGER EXHAUST GAS RECIRCULATION SYSTEM

Roy J. Pustelnik, Tinley Park, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 15, 1974, Ser. No. 460,850
Int. Cl.[2] F02D 23/00
U.S. Cl. 60—602 **1 Claim**



1. An exhaust gas recirculation system for reducing emissions of oxides of nitrogen from an internal combustion engine, including:

an intake manifold and an exhaust manifold;

a turbine in said exhaust manifold driven by exhaust gases from said engine, and an intake compressor in said intake manifold, said turbine being drivingly interconnected with said intake compressor for pressurizing intake gases before entering the engine;

a bypass manifold interconnected between said intake and exhaust manifolds to accommodate the recirculation of exhaust gases from the exhaust manifold into the intake manifold for selectively reducing emissions of oxides of nitrogen from the engine, said bypass manifold being connected to the intake manifold between the intake compressor and the engine to eliminate exhaust contaminant build-up in the compressor;

one-way valve means in the bypass manifold (a) preventing pressurized air within said intake manifold from flowing through the bypass manifold into the exhaust manifold, and (b) openable at a predetermined pressure differential between the exhaust and intake manifolds to recirculate exhaust gases into the pressurized intake air;

adjustable valve means in the exhaust manifold for selectively restricting exhaust gas flow from the engine in order to selectively recirculate exhaust gases from the exhaust manifold through the biasing valve means in the bypass manifold to the intake manifold;

control means for regulating the adjustable valve means to selectively recirculate exhaust gases, said control means including (a) linear variable differential transducers monitoring engine speed, engine throttle, intake manifold pressure, and exhaust manifold pressure, (b) a differential comparator interconnected with each of the linear variable differential transducers for receiving information

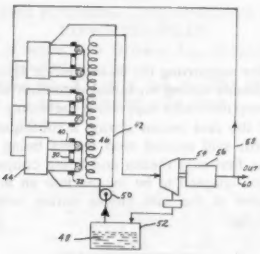
output signals therefrom, said differential comparator being preprogrammed in accordance with the performance characteristics of the engine for generating electrical command signals, (c) a servoamplifier interconnected with said differential comparator for receiving the electrical command signals, and (d) a servomotor interconnected with both said servoamplifier and said adjustable valve means for regulating the position of the valve in response to the electrical command signal.

3,925,990

SHOCK HEATED, WALL CONFINED FUSION POWER SYSTEM

Robert A. Gross, New Rochelle, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 28, 1973, Ser. No. 392,377
Int. Cl.² G21D 5/12
U.S. Cl. 60—644 4 Claims



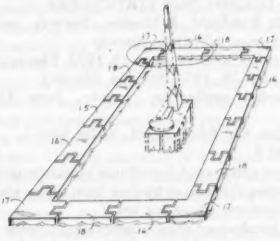
1. A fusion reactor power system comprising: means for controlling and containing a thermonuclear fusion reaction including, a pair of coaxial cylinders, each of said cylinders being closed at one end with a concave shaped reflecting wall and forming a cavity; means for absorbing heat energy from said containing means; heat exchange means located in the heat absorbing means; fluid means; a pump means for pumping said fluid through the heat exchange means; a turbine generator means connected to the heat exchange means whereby the fluid pumped through the heat exchanger will expand and cause the turbine to operate and generate electrical current.

3,925,991

FLOATING OIL FENCE

John M. Poche, 6317 Franklin Ave., New Orleans, La. 70122

Filed July 24, 1974, Ser. No. 491,522
Int. Cl.² E02B 15/04
U.S. Cl. 61—1 F 12 Claims



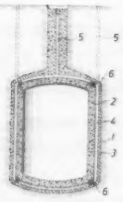
1. A floating oil fence comprising a plurality of interlocking pontoons, flexibly connected in a rectangular-like shaped form around oil or other pollutant, the interlocked pontoons capable of riding waves longitudinally and laterally without becoming disconnected and without permitting pollutants within the rectangle-like shape from seeping out to the water outside said rectangle, each of said pontoons having a rigid rectangular projection at one end and a vertically disposed U-shaped recess at the other end, the recess being adapted to slidably receive the rectangular projection of the next pontoon, said rigid rectangular projection being provided with a longitudinally and laterally disposed recess in the outer end and sides thereof through which passes both a vertically disposed coupling pin and a laterally disposed pin, the pins preventing the pontoons from becoming disconnected when interlocked.

3,925,992

METHOD AND RESERVOIR FOR STORING NUCLEAR RESIDUES

Arne L. Bäckström, Stockholm, Sweden, assignor to Svenska Entreprenad AB Sentab, Stockholm, Sweden

Filed June 13, 1974, Ser. No. 479,063
Claims priority, application Sweden, June 14, 1973, 7308359
Int. Cl.² B65G 5/00; G21F 9/24
U.S. Cl. 61—.5 12 Claims



1. A rock-cavity reservoir, especially for storing radioactive residues comprising:

a. a container disposed within an underground rock-cavity;

b. resilient means connecting top and bottom walls of the container to the walls of the rock-cavity such that the container is spaced from the walls of the rock-cavity; and

c. a liquid having a higher density than water disposed within the space between the rock-cavity walls and said container, said liquid having a sealing action on the walls of the rock-cavity and the container.

3,925,993

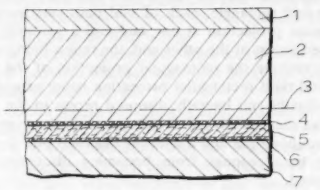
PROCESS FOR THE PREVENTION OF FROST HEAVES IN FINE-GRAINED SOILS

Wolfgang Roth, Los Angeles, Calif., assignor to Chemie Linz Aktiengesellschaft, Linz, Austria

Filed June 10, 1974, Ser. No. 478,163
Claims priority, application Austria, June 8, 1973, 5054/73
Int. Cl.² E02D 3/12, 5/00
U.S. Cl. 61—36 A 10 Claims

1. A process for the preparation of frost heaves in fine-grained soils, in particular of frost fractures in roads which comprises interrupting the transport of water in the soil capillaries in the region of the frost boundary by inserting, in the region of the frost boundary, a large-pored filter layer of loosely introduced grains made of rot-proof inert material, the pores of said filter layer are of a dimension, that any seepage water present is not held in the filter layer by capillary action and is protected, on its upper and lower sides, against contam-

ination by fine soil particles from the upper and lower adjacent soil layers by means of a water-permeable rot-proof web,



selected from the group consisting of fabric and fleece made of a thermoplastic synthetic resin.

3,925,994

SYSTEM OF ARMOURING EARTH

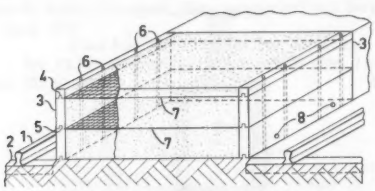
Bengt Broms, Vallingby, and Oleg Wager, Bromma, both of Sweden, assignors to AB Fodervavnader, Boras, Sweden

Filed June 20, 1974, Ser. No. 481,296

Claims priority, application Sweden, June 21, 1973, 7308792

Int. Cl.² E02D *5/00*

U.S. Cl. 61—39 **10 Claims**



1. A structure for reinforcing and anchoring a body of earth, comprising at least one comparatively wide, elongated, substantially continuous sheet of reinforcing material imbedded within said body of earth and oriented in a plane spaced from and substantially parallel to the external surface of said body of earth, said sheet having a net-like configuration throughout its length and width and being fabricated of a substantially non-corrosive material, each of the opposing comparatively wide ends of said elongated sheet being interposed and rigidly anchored between the facing edges of a pair of elongated, contiguous, superposed beam elements extending respectively in directions substantially parallel to the plane of said sheet.

3,925,995

ROOF SUPPORT FRAMES FOR MINING

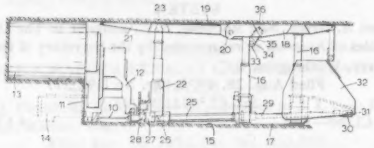
Guenter Harmsma, Bergkamen-Overberge; Harry Rosenberg, Leudinghausen; Johannes Laabs, Oberaden, and Kunibert Becker, Werl, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany

Filed Aug. 12, 1974, Ser. No. 496,687

Int. Cl.² E21D *15/44*

U.S. Cl. 61—45 D **6 Claims**

1. A longwall mining system comprising: a conveyor, a mining machine guided for movement along the conveyor, and a series of roof supports arranged alongside the conveyor; at least one roof support comprising a base, at least one first prop extending upwardly from the base, a roof bar means supported on said at least one first prop, at least one second prop depending from said roof bar means forwardly of said at least one first prop, said at least one second prop being retractable from a floor engaging position into a position spaced from the floor by a distance at least equal to the height of the conveyor, means for advancing the roof support in order to displace the said at least one second prop from a position rearwardly of the conveyor to a position forwardly of the conveyor, said means including a fluid operated ram means having a stroke shorter than the advance step of the roof support, said ram means being coupled between the conveyor and a sliding block, the base defining a guideway for the sliding block, said guideway having associated therewith a first



stop means for supporting the sliding block against the force of the ram means during an initial extension stroke thereof and second stop means for supporting the sliding block against the force of the ram means during a subsequent extension stroke thereof, said second stop means being located forwardly of the first stop means and being cooperable with a locking device adapted to be moved into an active position upon extension of the ram means during said subsequent extension stroke.

3,925,996

ROCK BOLT/ANCHORING RESIN CARTRIDGE SYSTEM

John Bentley Wiggill, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Sept. 27, 1974, Ser. No. 509,897

Int. Cl.² E21D *20/02*

U.S. Cl. 61—45 B **8 Claims**

1. In a method of anchoring a rock bolt in a drill hole by introducing into the drill hole a film cartridge containing a curable resin and forcing the bolt through the cartridge in a manner such as to shred the cartridge and cause the resin to mix with a curing system therefor and thereupon to harden, the improvement comprising forcing through the cartridge in the drill hole a bolt coated with a curing system component, the motion of the bolt causing the coating to become absorbed in the resin and admixed therewith.

3,925,997

BREAKWATER DEVICE FOR OFFSHORE SUBMERGED FOUNDATION STRUCTURES

Petter Sigvardt Hafskjold, Bekkestua, Norway, assignor to Ingenior F. Selmer A/S, Oslo, Norway

Division of Ser. No. 369,694, June 13, 1973. This application Aug. 28, 1974, Ser. No. 501,402

Claims priority, application Norway, June 13, 1972, 2083/72

Int. Cl.² E02D *27/38;* **E02B** *3/04*

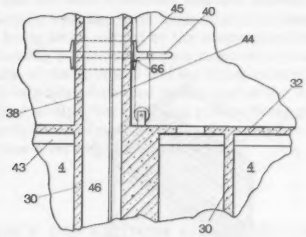
U.S. Cl. 61—46.5 **3 Claims**

1. An offshore submerged foundation structure comprising: vertical supporting columns extending from below sea level up to a working platform above sea level;

at least one breakwater device comprising a collar member defining an opening through which one of said supporting columns extends and a disk-shaped element secured rigidly to and surrounding said collar member;

hoist means mounted on said structure and secured to the

breakwater device to raise and lower the breakwater device along said one supporting column; and



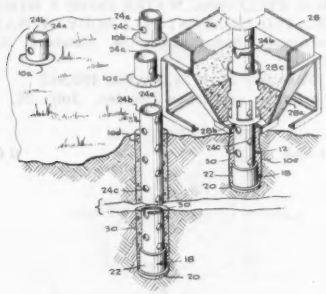
releasable locking means locking the breakwater to said one supporting column at a selected position therealong.

3,925,998

METHOD FOR FORMING CAST-IN-PLACE CASELESS CONCRETE PILES

William R. LeCorgne, New Orleans, La., assignor to Interpile USA, Inc., New Orleans, La.

Filed July 22, 1974, Ser. No. 491,481
Int. Cl.² E02D *5/34, 3/08*
U.S. Cl. 61—53.64 **10 Claims**



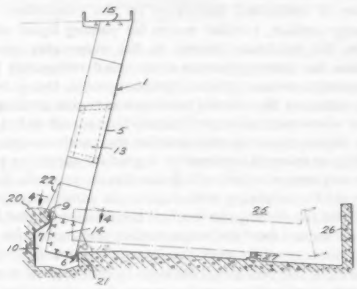
1. The method of forming plural cast-in-place caseless concrete piles in such proximity area to each other that earth transmission of forces during driving of some of the pile holes may damage the shape of other pile holes already formed in the proximity area, comprising the steps of forming a first pile hole in the earth by driving to the desired depth a first hole forming assembly including a first driving foot having a portion of cross-sectional shape and size corresponding to the desired cross-sectional shape and size of the pile hole and a first elongated driving mandrel of hollow tubular configuration releasably coupled to the driving foot and having a tube wall surrounding the hollow interior of the mandrel of slightly smaller size than the transverse size of the pile hole locating the outer surface of the tube wall sufficiently near the pile hole wall surface to protect the latter against inward distortion, temporarily leaving said first driving mandrel and driving foot in said first pile hole driven to said predetermined depth and forming a second pile hole located in said proximity area by driving a hole forming assembly of a second driving foot and a second driving mandrel of substantially the same construction as said first driving foot and mandrel to the desired depth in the earth while the first driving mandrel remains fully inserted in its respective pile hole protecting the shape of the first pile hole throughout its height against distorting forces, filling the formed pile holes with concrete, and withdrawing the driving mandrels from the pile holes before any concrete therein has set sufficiently such that mandrel withdrawal would damage the concrete, thereby leaving a cast-in-place caseless concrete pile in each pile hole.

3,925,999

DRY DOCKS

Paul Hugh Finden Andrew, Mt. Eliza, and Kenneth Ewing Moxham, Vale Park, both of Australia, assignors to Maunsell & Partners Pty. Limited, Australia

Filed Oct. 10, 1973, Ser. No. 396,298
Claims priority, application United Kingdom, Sept. 11, 1972, 42016/72
Int. Cl.² B63C *1/00;* **E02B** *7/40*
U.S. Cl. 61—64 **14 Claims**



1. A dock gate of the flap type located in a dock having a dock sill for sealing off at least part of the dock comprising in combination:

cantilever members rotatably mounted with respect to said dock sill,

a claw formed in or adjacent to said dock sill for receiving the lower end of said cantilever members when in their raised position,

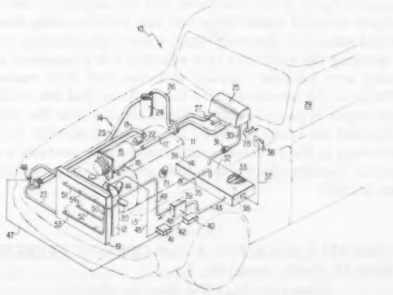
load bearing surfaces on opposite sides of said claw against which said cantilever members abut when in their raised position, one surface being higher than the other to thereby provide restraint to the cantilever members of the gate.

3,926,000

AUTOMOTIVE AIR CONDITIONER AND METHOD OF OPERATING THE SAME

Carlie D. Scofield, 31 - 40th St., Gulfport, Miss. 39501

Filed June 24, 1974, Ser. No. 482,577
Int. Cl.² F28C *1/00*
U.S. Cl. 62—121 **23 Claims**



1. In an automotive vehicle air conditioning system employing a normally gaseous refrigerant which is circulated therein, the air conditioning system being installed in an automotive

vehicle powered by an internal combustion engine subject to overheating, the air conditioning system including compressor means driven by the internal combustion engine for compressing the normally gaseous refrigerant to an elevated pressure at which the compressed refrigerant gas liquefies upon being cooled, condenser means including an air cooled heat exchange surface in heat exchange relationship with ambient air for condensing the compressed gaseous refrigerant and thereby producing liquid refrigerant, conduit means for passing the compressed refrigerant from the compressor means to the condenser means, liquid refrigerant evaporator means including a heat exchange surface in heat exchange relationship with relatively moist air whereby the evaporator heat exchange surface is cooled by evaporating liquid refrigerant and the moist air in contact therewith is cooled and liquid water is condensed therefrom on the evaporator heat exchange surface, conduit means for passing liquid refrigerant from the condenser means to the evaporator means, and means for passing gaseous evaporated refrigerant from the evaporator means to the compressor means, the air conditioning system or the internal combustion engine tending to overheat when operated at prolonged idling speeds in hot weather, the improvement in combination therewith comprising providing an internal combustion engine for supplying power for the automotive vehicle which also has an air intake for supplying air for admixing with fuel to be combusted therein, a radiator for cooling the internal combustion engine including an air cooled heat exchange surface and means for transferring air rearwardly over the internal combustion engine including a fan positioned forward of the internal combustion engine, temperature sensing means for sensing the temperature of at least one component carried by the said air conditioning system or the said internal combustion engine which varies directly in temperature with an increase in the operating temperature thereof, the temperature of the said component indicating when the said air conditioning system or the said internal combustion engine is overheating, and means for applying water to the said heat exchange surface of the condenser means, the last named means including means which is rendered operative to apply the water to the heat exchange surface when the temperature of the said component sensed by the temperature sensing means is above a predetermined level and which is rendered inoperative when the temperature of the said component drops below a predetermined level, the said means for applying the water including means for spraying liquid water on the front of the said heat exchange surface of the condenser in an amount effective to prevent the said air conditioning system or the said internal combustion engine from overheating and at the rate of about 1-10 gallons per hour, the said air cooled heat exchange surface of the radiator being positioned between the said heat exchange surface of the condenser and the fan whereby the liquid water sprayed on the front of the heat exchange surface of the condenser passes rearward into intimate contact with the said heat exchange surfaces of the condenser and the radiator in the form of liquid water of water vapor and aids in the cooling thereof, the said means for spraying liquid water also including means for spraying the water at a rate whereby it is evaporated upon passing into intimate contact with the said heat exchange surfaces of the condenser and the radiator and the resulting water vapor is passed rearwardly by the fan into the vicinity of the said air intake whereby the air admixed with the fuel combusted in the internal combustion engine contains a high moisture content which aids in reducing the operating temperature thereof.

3,926,001

MOVABLE DECK FOR A TOP-OPENING FREEZER

William M. Webb, Louisville, Ky.

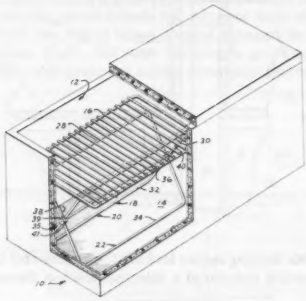
Filed Oct. 31, 1974, Ser. No. 519,525

Int. Cl.² F25D *25/00*

U.S. Cl. 62—378 **6 Claims**

1. In a top-opening chest freezer, an improved movable support frame for a rising bottom deck, comprising:

a plurality of frame members pivotally attached at their ends; and



torsion bar means having their respective ends attached to the ends of different ones of said frame members for biasing the deck toward the top opening of the freezer.

3,926,002

DEVICE FOR EXCLUDING WATER FROM A WORKING SITE LOCATED ADJACENT TO A BODY OF WATER

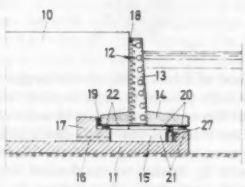
Birger Ludvigsson, Sodra vagen 38, Goteborg, Sweden (41234)

Filed July 23, 1974, Ser. No. 490,942

Claims priority, application Sweden, July 26, 1973, 7310358

Int. Cl.² B63C *1/08*

U.S. Cl. 61—64 **9 Claims**



1. A device for use in excluding water from a working site located adjacent a body of water and beneath the water level thereof in which a wall separates the working site from the body of water, with the wall having an opening providing communication between the working site and the body of water, a threshold and two side posts constituting said opening, the threshold including portions located inwardly and outwardly of the wall, the device comprising a door structure closing the opening, the door structure including a vertical waist portion defining the closure proper and a lower balancing portion rigidly connected to the waist portion, the lower balancing portion cooperating with at least one of said portions of the threshold to provide a zone communicating with the working site and the water pressure in the zone being dependent upon the water level within the working site, and means cooperable with the lower balancing portion and the threshold to prevent inward movements of the door structure

in a horizontal direction, the arrangement being such that upon evacuation of the working site, the water outside the working site will exert a laterally directed pressure upon the door structure with the main horizontal component of such pressure being taken care of by the cooperation between the lower balancing portion of the door structure and said at least one portion of the threshold and the tilting moment upon the door structure being balanced by the load of the water externally applied to the lower balancing portion being greater than the upwardly directed pressure in the zone which is dependent on the water level within the working site.

3,926,003

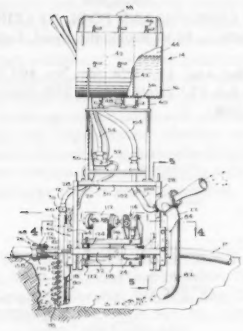
BOUYANCY AND ATTITUDE CORRECTION METHOD AND APPARATUS

Robert M. Norman, Route #1, Lafayette, La. 70501

Division of Ser. No. 175,448, Aug. 27, 1971. This application Oct. 25, 1973, Ser. No. 409,601

Int. Cl. E02f *5/02*; **F16l** *1/00*; **B63b** *35/42*

U.S. Cl. 61—72.4 **10 Claims**



1. An underwater trenching apparatus for burying pipeline and the like comprising:

a frame for positioning about the pipeline to be buried,

means secured to said frame for digging a trench to receive the pipeline,

means positioned on said frame to propel the apparatus along the pipeline,

independent buoyancy means supported upon said frame on each side of the pipeline,

each said buoyancy means having a plurality of separate individual compartments,

opening means in each compartment to provide communication with the water, and

means selectively operable upon the water level of each compartment to control the buoyant effect of each compartment including a gaseous inlet means and a gaseous outlet means for each compartment whereby the fore to aft and port to starboard attitude of the apparatus is controllable.

3,926,004

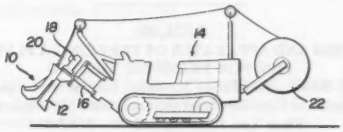
MULTI-CABLE LAYING BLADES OR CHUTES

John M. Baylor, Bettendorf, Iowa, assignor to J.I. Case Company, Racine, Wis.

Filed Dec. 9, 1974, Ser. No. 530,890

Int. Cl.² E02F *5/02*

U.S. Cl. 61—72.6 **12 Claims**



1. In a cable guiding chute assembly including a pair of spaced, generally vertical sidewalls defining therebetween a passageway to receive generally vertically oriented cables and to guide said cables into a generally horizontal orientation for placement in the ground, the improvement of:

a divider component interposed between said pair of sidewalls to define a plurality of cable guiding channels, said divider component including (a) a support plate generally parallel with the sidewalls and (b) a plurality of separators rigidly connected to the support plate and being generally perpendicular thereto, said separators extending from the support plate substantially to one of the sidewalls and having respective, generally parallel arcuate portions perpendicular to said sidewalls for guiding the cables into horizontal position for placement in the ground wherein the cable guiding channels are defined by the support plate, the separators and said one sidewall; and

releasable and engageable latching means, said means when engaged releaseably securing said divider component between the pair of sidewalls and said means when released accomodating telescopic withdrawal of said component from between the sidewalls whereupon the separators define laterally open channels to facilitate the insertion or removal of cables therefrom.

3,926,005

TUNNEL DRIVING APPARATUS

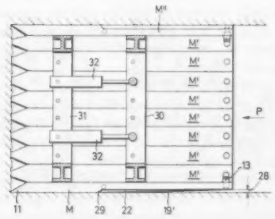
Adolf Foik, Altlunen, Germany, assignor to Gewerkschaft Eisenhutte, Westphalia, Germany

Filed July 2, 1974, Ser. No. 485,303

Claims priority, application Germany, July 14, 1973, 2335984

Int. Cl.² E01G *3/00*

U.S. Cl. 61—85 **24 Claims**



1. An advanceable shield for a tunnelling machine, said shield comprising: a plurality of individual longitudinally displaceable elongate members arranged side-by-side and disposed generally around the longitudinal axis of a tunnel, said elongate members contacting and supporting the tunnel wall to define a excavation space, means for supporting and guiding all said elongate members during longitudinal movement, means for selectively shifting one or more of said elongate

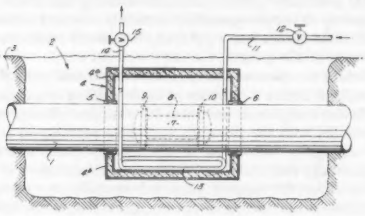
members at a time in the longitudinal direction of tunnel advance, at least one of said elongate members having a main body, a further component displaceably attached to said main body, and means for selectively displacing said further component generally transversally of the longitudinal axis of said main body, said selective displacing means operably controlling the direction of tunnel advancement.

3,926,006

METHOD AND APPARATUS OF FREEZING A PLUG IN A PIPE FOR PRESSURE TESTING

Leon E. Brooks, and James T. White, both of Shreveport, La., assignors to Cap-Con International, Inc., Shreveport, La.

Filed Apr. 9, 1973, Ser. No. 348,961
Int. Cl.[2] F16L *55/16*
U.S. Cl. 62—66 5 Claims



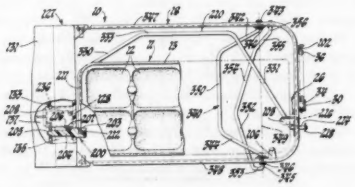
1. Apparatus for freezing a plug in a pipe comprising: a heat exchanger casing positioned about the pipe; heat exchange media within the casing about the pipe; at least one blocking plug within the pipe arranged to block off an area in the pipe within the casing, said blocking plug having a central passage therethrough and having a body with spaced resilient wiping flanges secured to the outer surface thereof; a valve in the passage; an ultrasonic frequency generator located exteriorally of the pipe; a receiver-rectifier located within the plug; and means actuated by the rectified signal to operate the valve.

3,926,007

ICE LEVEL SENSING ARM RETRACTOR

Ralph S. Braden, Bellbrook; Cecil C. Pugh, and Ralph R. Rigg, both of Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed July 22, 1974, Ser. No. 490,760
Int. Cl.[2] F25C *1/04*
U.S. Cl. 62—137 3 Claims



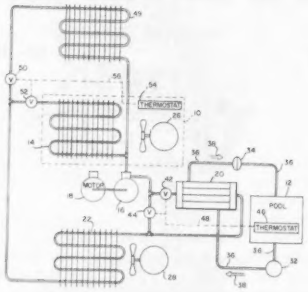
3. An automatic ice maker for use in a refrigerated compartment comprising a frame, an ice mold on said frame, means for ejecting ice from said mold, a bin for receiving ice pieces ejected from said mold located below said mold, a longitudinally extending ice level sensing arm pivotally received on said frame for movement between a gravity biased lower ice sensing position in said bin and an elevated ice maker shut-off position above said bin, the improvement residing in an integral sensing arm retractor torque rod including a U-shaped portion and a V-shaped portion each in separate planes which planes intersect at a common transverse pivotal axis, said U-shaped and V-shaped portions having first ends terminating in a common first pintle portion and connecting bight portion, said common pintle portion aligned on said transverse pivotal axis rotatably received in one side wall of said frame and said bight portion in the plane of said V-shaped portion, the free end of said U-shaped portion terminating in a second pintle portion aligned with said common first pintle portion for pivotal reception in the opposite side wall of said frame, the free end of said V-shaped portion terminating in a third pintle portion rotatably received in said frame opposite side wall offset from said second pintle portion, said rod torsional stress normally causing pivotal movement of said U-shaped portion in a clockwise direction engaging and biasing said sensing arm into an elevated position within the frame deenergizing said ice maker upon a predetermined outward movement of said bin, said bin upon being moved rearwardly into said freezer compartment beneath said ice maker engaging said V-shaped portion for pivotal movement in a counterclockwise direction, whereby said U-shaped portion is pivoted from its elevated position through an angle of about 90° into a substantially vertical plane disengages said sensing arm and allows said arm to gravitationally pivot to its ice sensing position within said bin such that said icemaker is energized if said arm senses a quantity of ice pieces therein below a predetermined level.

3,926,008

BUILDING COOLING AND POOL HEATING SYSTEM

Robert C. Webber, 8634 Brookville Road, Indianapolis, Ind. 46239

Filed Aug. 15, 1974, Ser. No. 497,765
Int. Cl.[2] E04H *3/18*; F25B *39/02*
U.S. Cl. 62—200 4 Claims



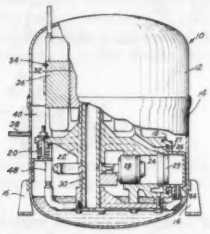
1. For use in cooling a building and warming a swimming pool, a system comprising a compressor, condenser means, an evaporator in cooling association with the interior of said building, and refrigerant conduit means for connecting said compressor, condenser means and evaporator in a conventional phase-change refrigeration circuit having a phase-change refrigerant therein, said condenser means having a first passageway for conducting the refrigerant therethrough and a second passageway in heat-conducting association with said first passageway, said second passageway having an inlet end and an exhaust end, a water pump, and water conduit means for inter-connecting said swimming pool, said pump, the inlet end of said second passageway and the exhaust end of said second passageway such that water is pumped through said second passageway, an auxiliary evaporator connected in said refrigeration circuit in parallel with said first-mentioned evaporator, said auxiliary evaporator being positioned externally to said building, and second thermostatically controlled valve means for by-passing said first-mentioned evaporator and conducting the refrigerant through said auxiliary evapora-

tor when the temperature in said building decreases to a predetermined level.

3,926,009
HERMETIC COMPRESSOR WITH INSULATED DISCHARGE TUBE

Sidney A. Parker, Fort Worth, Tex., and Seymour Rothstein, Highland Park, Ill., assignors to Lennox Industries Inc., Marshalltown, Iowa

Filed Jan. 27, 1975, Ser. No. 544,190
Int. Cl.[2] F25D *19/00*
U.S. Cl. 62—296 **16 Claims**

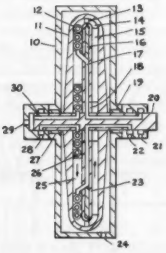


1. In a refrigerant compressor having compression mechanism for compressing a refrigerant and a discharge tube communicating with the compression mechanism for forwarding the relatively hot refrigerant to a refrigeration system, said compression mechanism being within an outer housing, a lubricant sump within the outer housing, said discharge tube being in heat exchange relationship with the lubricant in the lubricant sump, the improvement wherein an imperforate tubular member is disposed about the discharge tube in heat transfer relation with the lubricant sump in such manner as to insulate the discharge tube from the lubricant.

3,926,010
ROTARY HEAT EXCHANGER

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Continuation-in-part of Ser. No. 393,571, Aug. 31, 1973. This application Jan. 24, 1974, Ser. No. 436,124
Int. Cl.[2] F25B *3/00*
U.S. Cl. 62—401 **5 Claims**

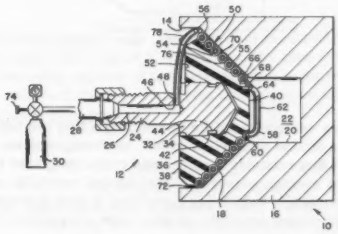


1. A heat exchanger comprising a rotor, means for mounting said rotor for rotation, said rotor having first and second closed passages extending outwardly from the axis of rotation of the rotor, a first passage means for connecting the outer ends and a second passage means for connecting the inner ends of said first and second closed outwardly extending passages to allow a fluid to flow outwardly in said first passage and inwardly toward the axis of rotation in said second passage, a compressible first fluid in said passages, a first heat exchanger carried by said rotor and a second heat exchanger carried by said rotor and located inwardly from the outermost part of said first heat exchanger, means for passing a second fluid through said first heat exchanger to remove heat from the first fluid, and means for passing a third fluid through said second heat exchanger to add heat to said first fluid, and means for rotating said rotor to cause said first fluid to flow outwardly in said first passage and be heated by compression due to centrifugal force and to flow inwardly in said second passage toward the axis of rotation of the rotor.

3,926,011
HEAD ASSEMBLY FOR A CRYOGENIC COOLER

Blase J. Sollami, Davenport, Iowa, assignor to The Bendix Corporation, South Bend, Ind.

Filed June 24, 1974, Ser. No. 482,045
Int. Cl.[2] F25B *19/00*
U.S. Cl. 62—514 **3 Claims**



1. A head assembly for a cryogenic cooling apparatus comprising:

a housing having a first blind bore therein, said first blind bore having a first section joined to a second section by a tapered section;

a frusto-conical body having a base and a vortex with a second blind bore which extends from the base toward the vortex, said body having a spiral groove which extends from said base to the vortex, said frusto-conical body having an annular rib extending from said second blind bore, said frusto-conical body having a slot which extends from said second blind bore to said spiral groove, said frusto-conical body engaging said tapered section to create a chamber between the vortex and the second section of the first blind bore;

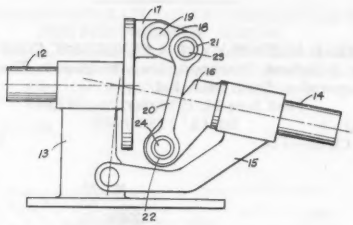
stem means having a head section and a connector section, said connector section having an axial passage which extends toward the head section, said axial passage having an opening adjacent the base of the frusto-conical body when said head section is secured in said axial bore, said connector section having an annular channel located in the head section for engaging said annular rib in the second blind bore for rigidly holding said stem means in a fixed position, said connector section transmitting a source of fluid under pressure to said opening; and

tube means located in said slot in said frusto-conical body and connected to said opening in the stem means having a finned section located in the spiral groove in the frusto-conical body and a distribution section located adjacent the vortex of the frusto-conical body, said distribution section having a closed end and an orifice located along a line concurrent with the axial bore, said orifice permitting said fluid to expand in said chamber and cool by the Joule-Thomson effect, said fluid in said chamber upon cooling being directed by said spiral groove through the finned section to precool the fluid flowing to the distribution section, said frusto-conical body being a non-metal through which heat transfer is inhibited to prevent the stem means from being cooled by conduction of the cooled fluid present in said chamber and flowing in said spiral groove.

3,926,012
CONSTANT VELOCITY UNIVERSAL JOINTS

Arnold E. Biermann, Redart, Va. 23142

Filed July 10, 1973, Ser. No. 377,939
Int. Cl.[2] F16D 3/54
U.S. Cl. 64—19 8 Claims

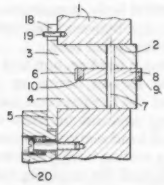


1. In a universal joint for connecting a first rotatable member to a second rotatable member, an averaging-lever pivoted on said first rotatable member and connecting links connecting said averaging-lever and said second rotatable member, said connecting links being connected to said averaging-lever and said second rotatable member with universal joint means.

3,926,013
CAM SYSTEMS FOR CIRCULAR KNITTING MACHINES

Harald Kurth, Mittweida; Dieter Laube, Frankenau, and Erich Berthold, Mittweida, all of Germany, assignors to VEB Wirkmaschinenbau Karl-Marx-Stadt, Karl-Marx-Stadt, Germany

Filed Oct. 16, 1972, Ser. No. 298,163
Int. Cl. D04b 9/00
U.S. Cl. 66—40 2 Claims

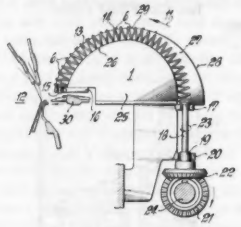


1. A cam system for a circular knitting machine comprising a cam retainer, cam carrier means, a cam element, means for releasably mounting said cam carrier means and said cam retainer whereby said cam carrier means may be selectively positioned in said cam retainer at a plurality of different angular positions, at least two cam surfaces on said cam element, means mounting said cam element on said carrier for positioning a selected cam surface whereby said cam surfaces may be selectively positioned in operative relationship in a knitting machine in ejecting, tucking and circular running positions, said cam carrier means comprising a cylindrical support having a transversely extending recess, a plate constituting said cam element and pivotally mounted in said recess, said cam surfaces being disposed on at least two edges of said plate, whereby said cam surfaces may be selectively positioned in operative relationship in a knitting machine.

3,926,014
WEFT STORAGE DEVICE FOR WARP KNITTING MACHINES

Günter Frehn, Monchen-Gladbach, Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Germany

Filed Apr. 11, 1974, Ser. No. 460,183
Claims priority, application Germany, Apr. 13, 1973, 2318622
Int. Cl.[2] D04B 23/06
U.S. Cl. 66—84 A 8 Claims

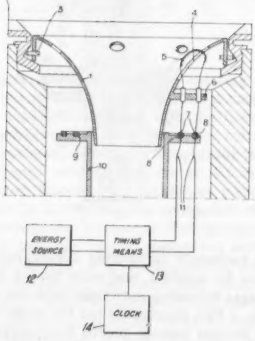


1. Weft thread storage device for a warp knitting machine having knitting needles for knitting weft and warp threads into a fabric web, comprising a pair of rotatable discs, a first and a second group of holding members each group mounted on one of said discs, said discs being spaced one from the other at respective locations at which they are adjacent opposite edges of a fabric web being knitted in the machine, and at least one intermediate support device disposed in the space between said groups of holding members to intercept weft threads extending between said groups of holding members, said discs and said intermediate support device being actuatable to transport said threads in direction toward the knitting needles of the machine, said support device having shape and dimensions similar to the discs.

3,926,015
CONTROLLED CUTTER FOR CIRCULAR HOSIERY MACHINES

Fulvio Sangiacomo, via 0. Villa 13, Brescia, Italy

Continuation-in-part of Ser. No. 873,341, Nov. 3, 1969, abandoned. This application Sept. 13, 1971, Ser. No. 179,701
Claims priority, application Italy, Dec. 5, 1968, 2841/68
Int. Cl.[2] D04B 35/34
U.S. Cl. 66—147 4 Claims



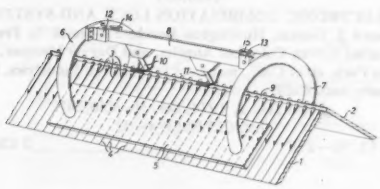
1. In a circular hosiery machine having a central cylinder, improved means for cutting the article manufactured by the machine, said improved means comprising;

a. an inverted, truncated, tubular element secured to a rotatable portion of the machine, said element being coaxially telescoped within and positioned proximate the upper end of the cylinder of the machine, said element having a slot in the wall thereof;
b. an electrical resistance filament of the type adapted to be coupled to and heated by a source of electrical energy;
c. means for supporting said filament adjacent said element at a position exterior thereof;
d. means for locating at least a portion of said filament within the interior of said element such that said filament makes contact along a predetermined path with the article being made by the machine; and
e. means for energizing and thereby heating said filament such that said heated filament is in contact with the article during selected time periods for effecting a longitudinal cut in the article as the article moves over said filament.

3,926,016
KNITTING MACHINES

John Flavell, Coundon, Coventry, and Keith Jeffcoat, Nuneaton, both of England, assignors to Courtaulds Limited, London, England

Filed May 2, 1974, Ser. No. 466,310
Claims priority, application United Kingdom, May 10, 1973, 22311/73
Int. Cl.² D04B *35/10*
U.S. Cl. 66—157 **7 Claims**



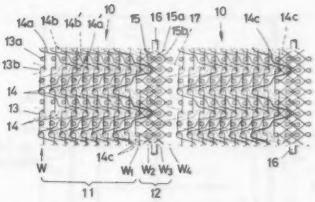
1. In a knitting machine having two cooperating arrays of latch needles arranged in opposed needle beds, means for independent actuation of successive needles in the arrays to move said needles between a lower and raised position, a carrier, support means positioning said carrier above said needle beds and movable longitudinally of the needle beds, and a hold-down element for holding down knitted loops as the needles rise, said hold-down element being supported from said carrier, the improvement comprising in combination mounting means for said carrier, said mounting means being fixed to said support means and said carrier being yieldably connected to said mounting means for movement between a first level below the level of the needles in their raised position, and a second level, said second level being higher than said first level, and switch means operable by movement of said carrier from said first level to said second level.

3,926,017
WARP KNITTED TAPE FOR SLIDE FASTENERS

Yoshio Matsuda, Nyuzen, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1974, Ser. No. 512,060
Int. Cl.² D04B *21/00*
U.S. Cl. 66—195 **6 Claims**

1. A warp-knitted tape for a slide fastener, which comprises a web portion and a marginal edge portion extending longitudinally of the web portion and adapted to carry a row of coupling elements each having a pair of spaced-apart legs extending in a transverse direction to said row of coupling elements, said web portion comprising chain stitches forming a plurality of longitudinally extending wales and at least two different groups of transversely extending lapping threads laid in to connect said wales coursewise, and said marginal edge portion comprising chain stitches forming a plurality of longitudinally extending wales and two different groups of tricot stitches extending across and interknitted with said wales

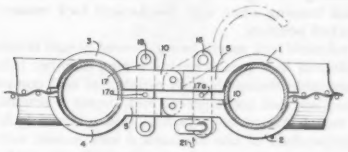


whereby said marginal edge portion is thickened and projects symmetrically with respect to the plane of the tape to accommodate securing said row of coupling elements to the marginal edge portion with the legs of the elements mounted astride of said marginal edge portion.

3,926,018
LOCKING DEVICE

Donald F. Joersz, Box 496, Kahlotus, Wash. 99335

Filed Feb. 11, 1974, Ser. No. 441,186
Int. Cl.² E05B *65/00, 65/08, 73/00*
U.S. Cl. 70—19 **5 Claims**

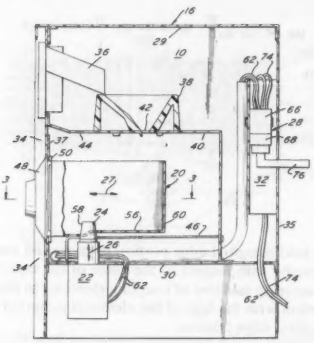


1. A detachable locking device for securing adjacent, cooperating closure members to prevent relative movement of the closure members comprising:
a. opposed pairs of clamping members having first and second longitudinally aligned portions, said members configured to engage closure members and said first and second portions including projections with centrally located receiving means;
b. interengaging, hinged connecting means joining the ends of said projections of said first portions with the ends of said projections of said second portions of each of said pairs of clamping members and cooperating with said portions to maintain them in predetermined relation when said clamping members are in closed condition; and
c. removable lock engaging members joined said first portions together and said second portions together when said clamping members are in closed condition, said lock engaging members disposed within said receiving means and having ends with openings therein projecting beyond the edges of said projections to receive locking means and extending transversely of the length of said projections when said clamping members are in closed condition whereby said locking device maintains the closure members in predetermined relation when said removable lock engaging member joins said first and second portions of each of said pairs of clamping members and receives said locking means.

3,926,019
LOCKING SYSTEM

Albert J. Mazeika, Philadelphia, Pa., assignor to Eugene H. Clement, Hi-Gene Laundry Co., Overbrook Hills, Pa.

Filed Mar. 15, 1974, Ser. No. 451,467
Int. Cl.² E05B 65/44
U.S. Cl. 70—85 **10 Claims**



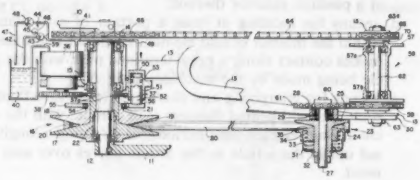
1. A locking system comprising:
(a) a housing having a frontal and rear portions;
(b) a compartment member insertable within said frontal portion of said housing;
(c) mechanical lock means mounted to said compartment member, said mechanical lock means having a latch member insertable within said frontal portion of said housing for capturing said compartment member within said housing when said mechanical lock means is in a locked position;
(d) solenoid lock means being secured to said housing, said solenoid lock means having a plug member retractably insertable through a floor member of said compartment member until said solenoid lock means is actuated; and
(e) switch means for actuating said solenoid lock means independent of said mechanical lock means, said switch means including a pair of contact blocks, each of said contact blocks having a plurality of positionally alignable contacts to complete a circuit coupled to a power source for actuating said solenoid lock means when said contact blocks are contiguously mated each to the other, said switch means mounted in said rear portion of said housing in remote positional relation to said mechanical lock means.

3,926,020
VEHICLE AUTOMATIC TRANSMISSION BICYCLE WITH ALTERNATE FIXED RATIO OR VARIABLE RATIO SPEED SENSITIVE POWER PATHS

Philip Dantowitz, 39 Nancy Ave., Peabody, Mass. 01960, and William A. Holmes, 7 Bradlee Road, Marblehead, Mass. 01945

Filed Jan. 9, 1974, Ser. No. 431,953
Int. Cl.² F16H 55/22, 11/04
U.S. Cl. 74—217 B **22 Claims**

1. A bicycle drive system in which operator driven pedals are connected to power a drive wheel comprising:
first drive shaft means connected to be driven by the operator pedals;
second drive shaft means connected to power the drive wheel of the bicycle;
first transmission means driven by said first drive shaft means through overrunning device means allowing said first transmission means to be driven in one direction by operation of the pedals and to overrun the pedals in the opposite direction;
second transmission means driving said second drive shaft means;
means interconnecting said first transmission means in driving relationship to said second transmission means;
control means for adjusting the speed ratio between said first and second transmission means through the path formed by said interconnecting means;

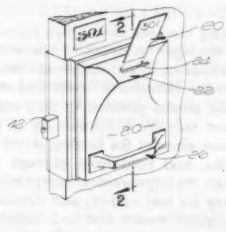


speed responsive means generating a signal as a function of pedal drive speed; and
means responsive to said speed responsive signal to adjust said control means to regulate said speed ratio as a function of said pedal drive speed responsive signal to maintain said pedal drive speed substantially constant upon attainment of the predetermined cadence pedalling speed range.

3,926,021
ELECTRONIC COMBINATION LOCK AND SYSTEM

Leonard J. Genest, Huntington Beach; Frederick E. Feagin, Tustin; Sylvan Cole, Los Angeles, and Daryle Messner, Buena Park, all of Calif., assignors to Monitron Industries, Inc., Santa Ana, Calif.

Filed Jan. 2, 1974, Ser. No. 430,247
Int. Cl.² E05B 49/02
U.S. Cl. 70—278 **2 Claims**



1. An independently operable electronic lock and system having an alterable combination, said lock being operable in response to insertion of a correct combination code, comprising:
a lock housing adapted to be secured in a door;
securing means attached to said housing;
alterable memory means within said housing storing combination information for operating said lock;
means within said housing for receiving and detecting a first stationary combination code inserted into the lock, comparing said inserted first combination code with said stored combination information, and generating a drive signal when a comparison is favorable;
said receiving and detecting means comprising a plurality of sensor coils connected to receive the output of an oscillator, each coil having a ferrous metal core and being connected to produce a first signal across said coil in the absence of a code entry and a second signal across said coil in the presence of a code entry and

a tuned circuit connected to produce a first output in response to the first signal across the respective coil and a second output in response to the second signal across the respective coil;

said inserted code entries comprising a least one electrically conductive area positioned adjacent to and within the magnetic field of at least one of said sensor coils to cause said second signal to be produced across said at least one coil, said first and second output signals providing a second combination code corresponding to said first combination code;

drive means within said housing adapted to operate said securing means in response to said drive signal;

means within said housing for changing said stored combination information to said inserted combination when a comparison is favorable; and,

an energy source connected to supply the power requirements of said lock and system.

3,926,022

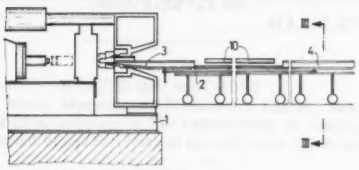
DEVICE FOR USE IN CONNECTION WITH METAL EXTRUSION PRESSES ALONG A PRESS PATH

Richard Raab, Rothenbach, Germany, assignor to Diehl, Nuremberg, Germany

Continuation of Ser. No. 267,038, June 28, 1972, abandoned. This application June 19, 1974, Ser. No. 480,729

Int. Cl.² B21J *7/46;* **B21B** *31/07*

U.S. Cl. 72—24 **5 Claims**



1. In combination with a horizontal extrusion press for extruding heated, softened, tubular articles, a device aligned with said press below its axis for conveying extruded, elongated, tubular articles from said press in which a tubular articles passes over a press-way receiving an article from said press, said press-way having a plurality of nozzles spaced longitudinally along said press-way and directed generally upwardly, air supply means connected to said nozzles to supply air under pressure to said nozzles and to form upwardly directed jets of air against the under side of a tubular articles passing along said press-way, said upwardly directed jets of air cooling and hardening said extruded articles and maintaining it centered in said press-way during its passage.

3,926,023

HYDROSTATIC EXTRUSION PROCESS FOR PRODUCING FINE GAUGE WIRES

Makoto Hayashi; Masanori Hinata; Minoru Yokota, and Takasi Kondo, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

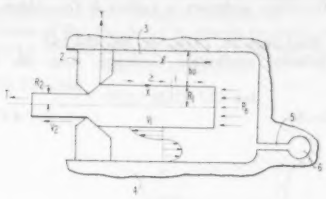
Filed Feb. 6, 1975, Ser. No. 547,853

Claims priority, application Japan, Feb. 6, 1974, 49-15614

Int. Cl.² B21C *23/22*

U.S. Cl. 72—60 **2 Claims**

1. In a hydrostatic extrusion process for producing relatively fine gauge wires less than 250μ in diameter by liquid pressure extruding a metal ingot of larger diameter than that of a die opening, through said die opening of a high pressure container, the improvement wherein a liquid providing a viscosity less than 100 poise at a pressure of 10,000 atmospheric is



employed as the pressure medium contained in the high pressure container.

3,926,024

METHOD AND DEVICE FOR REGULATING THE THICKNESS OF ROLLED PRODUCTS

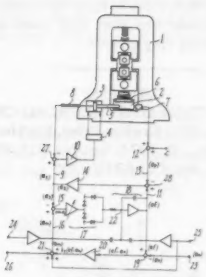
Jean Philippe Mornas, St. Etienne, France, assignor to Compagnie des Ateliers et Forges de la Loire (St Chamond, Firminy, St Etienne, Jacob-Holtzer), Paris, France

Filed Oct. 27, 1970, Ser. No. 84,299

Claims priority, application France, Oct. 31, 1969, 69.37440

Int. Cl.² B21B *37/08*

U.S. Cl. 72—8 **7 Claims**



1. In a rolling mill having a position-corrected under load clamping system, a means for accurately regulating the thickness of the rolled product, comprising:

a. means to measure the rolling effort of the rolling mill;

b. a primary correcting circuit connected to said measuring means and adapted to set the value of a clamping position correction in such a manner that the measured rolling effort is constantly very substantially equal to a first reference magnitude called an effort reference value;

c. a second correcting circuit connected to said first circuit and to said measuring means and adapted to determine the magnitude of the said effort reference value, said second circuit comprising:

a dead zone device having the property of transmitting, in magnitude and sign, of the signal applied to the input of this device, only the fraction lying outside of a predetermined range, the limits of this range being disposed symmetrically on either side of a predetermined magnitude called a position reference,

a device having integrating and memory functions responsive to said dead zone device in such a manner that its output signal is the integral of the signal delivered by said dead zone device, this output signal constitutes the effort reference value and is connected to a reference inlet of said primary circuit; and

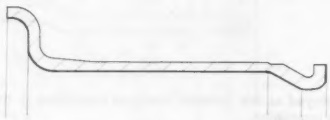
d. means for adjusting the width of the dead zone.

3,926,025

METHOD OF PRODUCING SPECIAL WHEEL RIMS

Paul B. Schröder, Hamm, and Günter Pollkötter, Neubeckum, both of Germany, assignors to Leifeld & Co., Ahlen, Germany

Filed June 28, 1974, Ser. No. 484,157
Claims priority, application Germany, Aug. 28, 1973, 2343247
Int. Cl.² B21D 53/30
U.S. Cl. 72—84 4 Claims



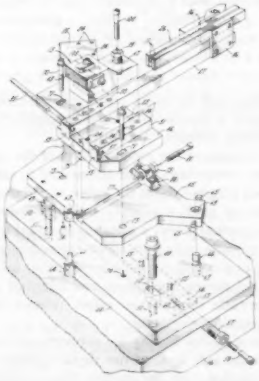
1. A spinning process for making a special wheel rim from a metal cylindrical blank, said wheel rim having a recessed spring ring groove on one side, a central rim section, a slant shoulder and a raised wheel flange on the other side, said method comprising the steps of: spin forming a spring ring groove on one side of the metal blank to reduce the thickness of said initial metal blank and to form said groove with a predetermined wall thickness and with its final wheel spring groove shape, stretch drawing the remainder of the blank to reduce its cross-sectional thickness from said predetermined wall thickness and to extend the axial length of the remainder of said blank, spin drawing a slant shoulder on the other side of the blank, and spin forming the other side of the stretched metal blank radially outwardly to form the raised wheel flange having a wall thickness less than said predetermined wall thickness for the spring ring groove.

3,926,026

FLAT DIE THREAD ROLLING MACHINE

Warren M. Jackson, 5071 Crofton Drive, Rockford, Ill. 61111

Filed Nov. 20, 1974, Ser. No. 525,485
Int. Cl.² B21H 3/06
U.S. Cl. 72—90 6 Claims



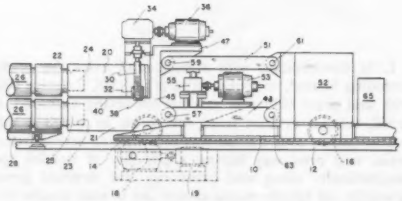
1. A flat die thread rolling machine comprising a support; stationary and movable dies on said support and having opposed faces with thread forming elements extending therealong; means for reciprocating said movable die back and forth relative to said stationary die between first and second positions and along a first path extending in the same general direction as said thread forming elements; mechanism for feeding a fastener blank between said dies each time said movable die is in said first position; and means mounting said stationary die on said support for selective adjustment relative to said movable die, said mounting means comprising a first member mounted on said support for back and forth linear adjustment along a path extending substantially parallel to said first path thereby to enable adjustment of the longitudinal alinement of the thread forming elements of said dies, a second member mounted on said first member for back and forth angular adjustment relative to said first member about an axis extending substantially perpendicular to said first path thereby to enable adjustment of the squeeze angle between the thread forming elements of said dies, a third member mounted on said second member for back and forth linear adjustment relative to said second member along a path extending substantially perpendicular to said first path thereby to enable adjustment of the transverse spacing between the thread forming elements of said dies, and a fourth member carrying said stationary die and mounted on said third member for back and forth angular adjustment relative to said third member about an axis extending substantially parallel to said first path thereby to enable adjustment of the taper angle between the thread forming elements of said dies; and said feeding mechanism being mounted on said third member and being adjusted with said stationary die whenever said first, second or third members are adjusted.

3,926,027

ROLL CHANGING APPARATUS FOR A ROLLING MILL OR THE LIKE

Werner Krumme, Pittsburgh, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Feb. 11, 1975, Ser. No. 549,129
Int. Cl.² B21B 31/08
U.S. Cl. 72—239 5 Claims



1. An apparatus for removing and replacing rolls to and from a rolling mill or the like comprising:

a car arranged on the operator's side of the said mill,

said car including a counterweight mounted on one end arranged to offset at least a part of the weight of one or more of said rolls when supported by said car,

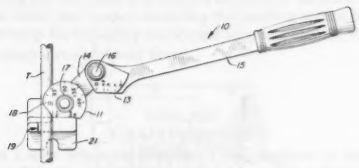
two members carried by the other end of said car having portions for receiving and supporting in a cantilever fashion a different one of said rolls in a position parallel to their working positions when said rolls are in said mill,

means for displacing one of said members parallel and relative to other member in a direction coincident to a plane containing the axes of said rolls,

means for displacing said two members in unison in said direction, and

means for horizontally moving said car to and from said rolling mill.

3,926,028
TUBE BENDER
Leonard J. Kowal, Prospect Heights, Ill., assignor to Imperial-Eastman Corporation, Chicago, Ill.
Filed Aug. 23, 1974, Ser. No. 500,156
Int. Cl.² B21D 11/04
U.S. Cl. 72—319 18 Claims

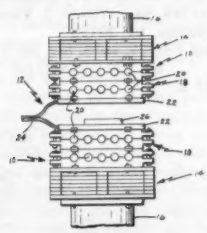


1. In a manually operable tube bender having a mandrel provided with a peripheral tube receiving groove, a shoe swingably mounted to said mandrel, and a handle for swinging said shoe about said mandrel for urging a tube into said groove in a tube bending operation, the improvement comprising:

a one-piece combination mandrel support and tube holder having a first integral portion defining a male clamp element adapted to be clamped fixedly in a female clamping device for supporting the tube bender during a tube bending operation, a second integral portion defining a hook adapted to be engaged by the tube for preventing longitudinal movement thereof during the tube bending operation, and a third integral portion defining a connector; and

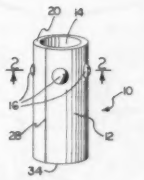
securing means for fixedly securing said connector to said mandrel.

3,926,029
HEATED DIE ASSEMBLY
David J. Abson, Medway, and Ferdinand J. Gurney, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Apr. 30, 1974, Ser. No. 465,711
Int. Cl.² B21J 13/02
U.S. Cl. 72—342 14 Claims



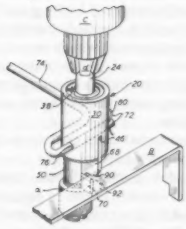
1. A heated die assembly adapted to be used in conjunction with a forge press comprising a load bearing insulated stack, at least one heater block secured at one end thereof to said load bearing insulated stack and a die face plate secured to the other end of said heater block, said load bearing stack being made of alternate layers of at least two plates, one of said plates being made of a material having a high toughness, the other of said plates being made of a composite construction of two materials, one of said materials of said composite construction having high toughness and the other of said materials of said composite construction having a high compressive strength and low thermal conductivity and said heater block being made of two heater elements which contain a means for generating heat therein.

3,926,030
METHOD FOR MAKING WIRE PROTECTOR
William R. Baillie, Hoffman Estates, Ill., assignor to Blue Ribbon Industries, Inc., Arlington Heights, Ill.
Division of Ser. No. 341,476, March 15, 1973, Pat. No. 3,855,413. This application Aug. 12, 1974, Ser. No. 496,760
Int. Cl.² B21D 51/10
U.S. Cl. 72—368 2 Claims



1. A method of making a wire protector of sheet steel which comprises forming a rectangular blank of sheet steel and punching recesses in one surface on a line parallel with a pair of opposite edges of said blank simultaneously producing surface protrusions on the opposite surface of said blank, and roll forming the blank into a hollow cylindrical tube so that the two other opposite edges are tightly abutting in a seam, the protrusions being unaffected by the rolling and defining a circumferential line on the exterior of said tube, the recesses being punched prior to forming of the tubular body.

3,926,031
DEBURRING DEVICE WITH OPPOSITELY ACTING DEBURRING ELEMENTS
Hildaur L. Neilsen, 2 Juniper St., Metuchen, N.J. 08840
Filed Jan. 23, 1975, Ser. No. 543,271
Int. Cl.² B21J 7/32
U.S. Cl. 72—407 10 Claims

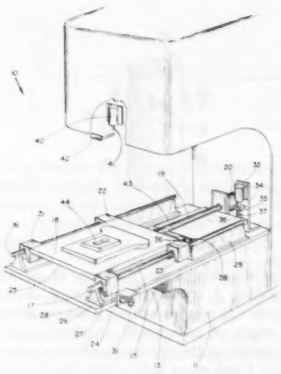


1. A deburring device for smoothing edges of sheet material, comprising a housing, intermittently impacting hammer means supported within said housing, means for rapidly operating said hammer means, a first peening tool member loosely connected to said housing and coacting with said hammer means to be vibratorily actuated thereby to engage and deburr an edge of a related workpiece of sheet material, an extension stem rigidly integral with said housing, extending alongside said tool member in parallelism to the direction of vibratory movement of the latter, and a second peening tool member carried on said stem in position to support said workpiece in line with and against said vibratory movement of said first tool member.

3,926,032
SHUTTLE LOADER FOR PRESS

Wayne D. Brooks, Losantville, and Thomas L. Hendricks, New Castle, both of Ind., assignors to Magna Machine & Tool Co., New Castle, Ind.

Filed June 6, 1973, Ser. No. 367,569
Int. Cl.² B21J *13/00*
U.S. Cl. 72—419 **10 Claims**



9.

The combination of:

a press including a press bed and a ram movable to and from said press bed, said ram having mountable thereon a first die shoe;

a support frame mounted on said press bed and extending outwardly from beneath said ram;

a shuttle slidably mounted on said support frame to support a second die shoe complementary to said first die shoe;

drive means including a driver connected to said shuttle, said drive means being operable to move said shuttle from a press operating position immediately beneath said ram to a remote position outwardly from said ram and back to said operating position;

first locking means operable to lock said shuttle in said operating position, said locking means includes an actuator and a movably mounted locking rod on said support frame, said actuator is operably connected to said movably mounted locking rod which moves into said shuttle when said shuttle moves to said operating position and contacts said actuator, said locking rod projects into said shuttle preventing said shuttle from moving from said operating position;

a pressure plate mounted atop said support frame and beneath said ram; and wherein:

said shuttle includes a main frame mounted upon but spaced from said support frame to pass over said pressure plate as said shuttle moves to said operating position, said pressure plate has sufficient thickness to contact said main frame and limit downward movement thereof when said ram applies downward force thereto.

3,926,033
TOGGLE-JOINT PRESS

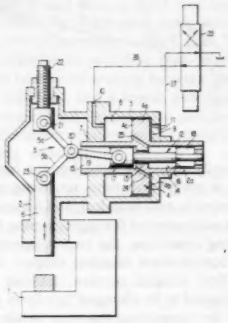
Gaston Forichon, Boulogne, France, assignor to Regie Nationale Des Usines Renault, Billancourt, France

Filed Jan. 28, 1975, Ser. No. 544,816
Claims priority, application France, Jan. 28, 1974, 74.02670
Int. Cl.² B21J *9/18*
U.S. Cl. 72—451 **10 Claims**

1. A fluid-driven toggle-joint press of the type comprising a cylinder having a control piston means moveable therein which is joined by a connecting rod to the knee of a toggle joint formed by at least two links, one link being hinged at a fixed point and the other at the end of a tool-holding piston, the press being characterized by the improvement comprising:

said control piston means being formed of two relatively moveable coaxial pistons; and

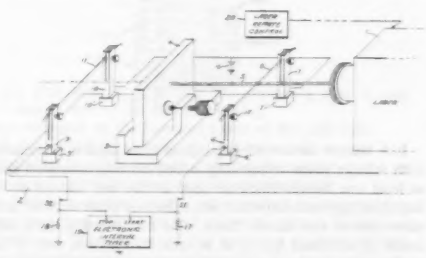
means for stopping and thus limiting the travel of at least one of said coaxial piston while permitting the other to continue its motion to effect the return of the tool-holding piston.



3,926,034
DEVICE FOR MEASURING LASER BEAM PENETRATION TIME

Conrad M. Phillippi, 7420 Brantford Road, Dayton, Ohio 45414; Donald F. Stevison, 218 Zimmerman St., New Carlisle, Ohio 45344, and Willard J. Ekman, 4543 Kendall Drive, Woodbridge, Va. 22193

Filed Feb. 27, 1975, Ser. No. 553,699
Int. Cl.² G01N *25/00*
U.S. Cl. 73—15 R **4 Claims**



1. Apparatus for measuring the time required for a laser beam to penetrate a test specimen of a material as a measure of the resistance of the material to laser radiation, said apparatus comprising: a laser, having on-off control means, for producing, when on, a beam of radiation of predetermined size and power density; means for supporting a test specimen of the material in the path of said beam; first and second small

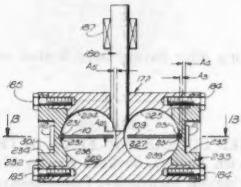
conductive switch strips each capable of being easily severed by said beam; means for holding said first strip tautly across the path of said beam between the specimen and the laser; means for holding said second strip tautly across the path of said beam on the opposite side of the specimen from said laser; an electronic interval timer having start and stop circuits; means including the holding means for said first strip for including the first strip as a control element in the start circuit of said timer; and means including the holding means for said second strip for including the second strip as a control element in the stop circuit of said timer.

3,926,035

GRAVITOMETER

Gerald Lance Schlatter, Boulder, Colo., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,022
Int. Cl.² G01N 9/00
U.S. Cl. 73—32 A **5 Claims**



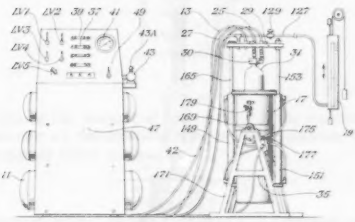
1. A gravitometer comprising: a body having first and second chambers therein to contain air and a gas of interest, respectively; first and second spring metal ferromagnetic cantilevered vanes mounted in said first and second chambers, respectively, each vane having one end fixed relative to said body and a free end opposite thereof for immersion in said air and gas, respectively, said first vane free end being positioned to vibrate back and forth in a first pair of predetermined opposite directions in said first chamber without touching said body, said second vane free end being positioned to vibrate back and forth in a second pair of predetermined opposite directions in said second chamber without touching said body, said first pair of directions being approximately parallel to the direction in which the thicknesses of both of said first and second vanes are measured, said second pair of directions being approximately parallel to the direction in which the second vane thickness is measured; driver coil means fixed relative to said body in a position to attract said vane free ends when said coil is energized; first and second pickups fixed relative to and contiguous to the said one end of said first and second vanes, respectively, to produce respective output signals of the respective vane frequencies; and amplifier means connected from both of said pickups to said drive coil means to impress an output signal on said driver coil means to cause the current therein to flow alternately in opposite directions and to cause said first and second vanes to vibrate continuously at respective frequencies equal to one-half the frequencies of the output signals of said first and second pickups, respectively, said amplifier means including first and second means connected from said first and second pickups, respectively, to produce first and second signals of first and second frequencies, respectively, equal to one-half the frequencies of the output signals of said first and second pickups, respectively, and third means connected from said first and second means to produce a sum signal directly proportional to the sum of said first and second signals, said amplifier means being connected to said driver coil means to impress said sum signal thereon.

3,926,036

TEST APPARATUS FOR HIGH PRESSURE CONTAINER

James C. Bower, 7401 Bettinger, Grapevine, Tex. 76051

Filed Nov. 1, 1974, Ser. No. 520,028
Int. Cl.² G01M 3/02; B08B 9/08
U.S. Cl. 73—37 **7 Claims**



1. A combination apparatus system for cleaning and pressure testing and drying a high pressure container having an opening leading to its interior comprising:

a. a closed system for pressure testing said container; said closed system including:

i. two tanks for holding a volume of a first liquid chemical less than the total volume of said two tanks; said first liquid chemical having good cleaning characteristics, having high vapor pressure for rapid vaporization, and being nonflammable;

ii. first and second conduits having first ends adapted to be coupled in fluid communication with the interior of said high pressure container by way of its opening;

iii. a first pair of flow lines comprising two lines separately connected to the tops of said two tanks;

iv. first flow control means for separately connecting said first conduit with either of said lines of said first pair;

v. a second pair of flow lines comprising two lines separately connected to the bottoms of said two tanks;

vi. second flow control means for separately connecting said second conduit with either of said lines of said second pair of flow lines; and

vii. pressurizing means connected to said second conduit for elevating the pressure interiorly of said container once said container has been filled with said liquid chemical;

b. an open system for measuring the volumetric expansion of said container when subjected to pressure; said open system including:

i. a reservoir for a second liquid;

ii. a jacket means adapted for insertion of said container therewithin; having a lid means for sealingly engaging the top of said jacket and encompassing said container;

iii. conduits connected with said reservoir and said lid means;

iv. liquid flow means for flowing said second liquid into and from said jacket and about said container means disposed therewithin when said lid means is closed; and

v. differential volume measuring means connected with one of said conduits that are connected with said lid means for measuring the differential volume of liquid displaced by said container when subjected to high pressure; said differential volume measuring means having means for obtaining a zero reading before pressure is applied interiorly of said container within the filled jacket and a means for reading the volume displaced by said container after said pressurizing thereof.

3,926,037
PROCESSES AND DEVICES FOR DETERMINING PROPERTIES OF BODILY MUCUS

Louis Kopito, Brookline; Samuel R. Schuster, Wellesley, and Harold Kosasky, Brookline, all of Mass., assignors to Ovutime, Inc., Wellesley, Mass.

Filed Mar. 14, 1975, Ser. No. 558,247
Int. Cl.² G01N *33/16, 13/04*
U.S. Cl. 73—53 **10 Claims**

1. A device for determining the properties of bodily mucus comprising:

a. a pair of separable cooperating members, each said member having a working face defining a bearing surface of predetermined configuration, said bearing surfaces in face to face relationship define a plurality of regions adapted to contain a bodily mucus sample, the surface area of said regions being greater that the surface area of the interface between said bearing surfaces; and

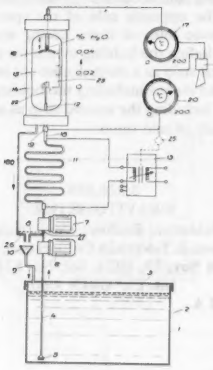
b. indicating means operatively connected to at least one of said members for providing an indication of the force required to separate said members when said regions contain a bodily mucus sample, the force required to separate said bodily mucus sample at said interface defines the property of said bodily mucus.

3,926,038
METHOD AND APPARATUS FOR TESTING OF A LQIUID TO DETERMINE A MINOR ADMIXTURE OF A LOWER BOILING POINT MATERIAL

Joachim Wunning, Warmbronn; Rolf Bieber, Ditzingen, and Heinz Lustig, Friolzheim, all of Germany, assignors to Firma J. Aichelin, Stuttgart, Germany

Filed May 8, 1974, Ser. No. 467,912
Claims priority, application Germany, July 5, 1973, 2334255
Int. Cl.² G01N *25/00*
U.S. Cl. 73—61.1 R **17 Claims**

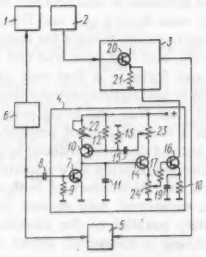
1. A method for determining the amount of a minor liquid component in a liquid comprising a major component and said minor component, said minor component having a lower boiling point than said major component, comprising passing a predetermined volume of said liquid being tested through a heating device whereby said liquid being tested is heated during a predetermined period of time to a predetermined temperature which is above the boiling point of said minor liquid component and below the boiling point of said major liquid component whereby any minor liquid component contained in said liquid being tested is vaporized, said predetermined period of time being insufficient for separation of said vaporized minor component from said major component, and then passing said heated liquid through a nozzle defining a constricted opening to produce an unsupported liquid jet, measuring a dimension of said unsupported liquid jet, and then comparing said measured dimension with a predetermined dimensional value corresponding to an unsupported liquid jet for the same predetermined volume of a liquid consisting of said major component passed through said constricted opening after having been heated under the same conditions.



3,926,039
PULSED ULTRASONIC FLAW DETECTOR

Oleg Nikolaevich Zhukov, Sovkhoz Krasny Mayak, 7, kv. 4; Moisei Davidovich Medvinsky, Pushkinskaya ulitsa, 9, kv. 58, and Vladimir Izidorovich Ryk, pereulok Axakova, 18, kv. 14, all of Moscow, U.S.S.R.

Filed June 7, 1973, Ser. No. 367,874
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.7 **6 Claims**



1. A pulsed ultrasonic flaw detector for testing materials, comprising an ultrasonic oscillator; a receiver for signals reflected from the internal defects in the material under test; a first amplifier for said receiver, including at least one stage for amplifying the signals introduced from said receiver; an AC negative feedback circuit in said one amplifier stage; an operational amplifier having therein a current generator circuit and at least two stages, including an output stage; said operational amplifier being connected to said first amplifier via said negative feedback circuit; said generator circuit having a controllable internal resistance and having applied thereto AC positive feedback furnished by one of said stages of said operational amplifier; in the latter, a capacitor coupled to said generator circuit and to said one stage thereof, said capacitor forming a signal to control said first amplifier, thereby compensating for the effect of the depth, at which the defects occur, on the amplitude of the signals reflected therefrom; an indicator connected to said first amplifier; a synchronizer connected to said oscillator, to said operational amplifier and to said indica-

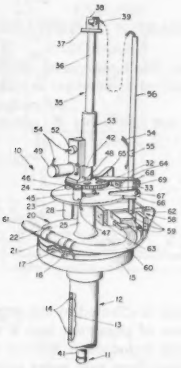
tor, in controlling relation thereto; and means for quickly discharging said capacitor which forms the control signal.

3,926,040

DEVICE FOR GUIDING SENSOR MOVEMENT WITHIN A TUBE

Thomas E. Cowell, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 4, 1973, Ser. No. 394,428
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.8 S **18 Claims**



1. A positional control mechanism for guiding mechanical movement within a tube, comprising:

a. a mounting base defining a central guideway and structured for removable placement on an end of a tube;
b. a drive gear having an opening therethrough in alignment with the central guideway and a drive element extending into the opening, the drive gear being rotatably coupled to the mounting base;
c. an elongated carrier pipe extending through the opening in the drive gear and mouting base central guideway and formed along one longitudinally extending portion with a drive slot for receiving the drive element and along a different longitudinally extending portion with a recessed gear rack;
d. a working head carried by the carrier pipe;
e. a first motor (28) connected to the mounting base and operatively coupled with the drive gear to cause rotation of the carrier pipe;
f. a second motor (49) mounted on the drive gear and operatively coupled with the gear rack to selectively cause axial movement of the carrier pipe;
g. actuator means for operating the first motor and second motor to cause movement of the carrier pipe and repositioning of the working head within the tube; and,
h. bearing means located in the mounting base central guideway for receiving the carrier pipe in sliding, rotatable engagement.

3,926,041

PORTABLE HARDNESS INSPECTION TOOL

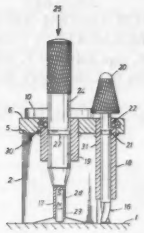
Robert B. Shaw, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 221,224, Jan. 27, 1972, abandoned. This application Dec. 20, 1972, Ser. No. 317,023
Int. Cl.² G01N *3/42*
U.S. Cl. 73—85 **10 Claims**

10. A method of measuring the hardness of a test piece comprising the steps of:

positioning an expendable indenter above the test piece;

driving the indenter against the test piece a known distance; and



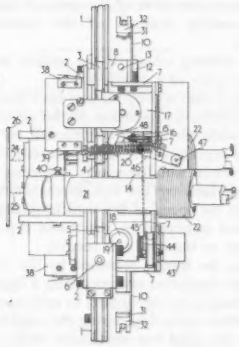
measuring the amount of deformation of the indenter, the amount of deformation being a direct measure of the hardness of the test piece.

3,926,042

METHOD AND APPARATUS FOR FOLLOWING THE MOTION OF A DATUM MARK

Arthur Rowlatt More, Oxted, and Robert John Whittington, Sevenoaks, both of England, assignors to H. W. Wallace & Company, Limited, England

Filed Feb. 19, 1974, Ser. No. 443,755
Int. Cl.² G01B *11/16*
U.S. Cl. 73—88 A **8 Claims**



1. An apparatus for following the motion of a datum mark characterised in comprising a rectilinear rail, a carriage movable longitudinally of the rail and supported thereby, a reversible electric motor on the carriage the drive of which makes driving engagement with the rail, an electric lamp means on the carriage arranged to illuminate a datum mark positioned adjacent the rail, a photo-electric cell on the carriage having a pair of light sensitive electrodes closely adjacent one another, optical means for projecting an image of a datum mark on the light sensitive electrodes of the photo-electric cell, boundary between the electrodes being rectinilinear and at right angles to the longitudinal axis of the rail, means for deriving an electric signal from each light sensitive electrode of the photocell means, for comparing the signals the one with the other and deriving a difference signal therefrom, means for amplifying the difference signal and means for applying the difference signal to the electric motor of a polarity as will operate the motor in that direction of rotation as will tend to maintain or will move the carriage in such direction as to restore the position of the image of the datum mark symmetrical with the boundary between the electrodes in the photocell

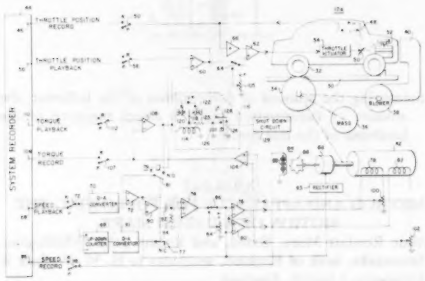
as and when the datum mark moves along the path parallel to the said rail.

3,926,043

ROAD SIMULATOR SYSTEM WITH PROVISION FOR ENGINE DEGRADATION COMPENSATION

Richard A. Marshall, and Edward F. Miller, both of Indianapolis, Ind., assignors to Laboratory Equipment Corporation, Mooresville, Ind.

Filed Apr. 24, 1974, Ser. No. 463,470
Int. Cl.² G01L 5/13
U.S. Cl. 73—117 27 Claims



1. The method for simulating a road test of an accelerator controlled vehicle comprising the steps of:

road testing the vehicle to provide a road test record having signals representative of the speed of the vehicle and the corresponding position of the accelerator recorded thereon;

placing a driving wheel of the vehicle in contact with a traction roller of a dynamometer;

simulating a road test by playing back the road test record and adjusting the position of the accelerator in accordance with the position indicated by the accelerator position representative signal recorded on the road test record while simultaneously adjusting the mechanical load provided by the dynamometer traction roller to maintain the speed of the vehicle substantially similar to the speed indicated by the speed representative signal recorded on the road test record;

monitoring the torque provided by the vehicle during the road test simulation and recording a signal representative of the torque corresponding to each speed and accelerator position occurring during the road test simulation;

repeating the road test simulation while playing back the record torque representative signal and comparing the torque indicated by the recorded torque representative signal with the torque provided by the vehicle during the repeated road test simulation; and

adjusting the accelerator position of the vehicle during the repeated road test simulation as required to maintain the torque provided by the vehicle substantially similar to the torque indicated by the recorded torque representative signal obtained during the road test simulation and to maintain the speed of the vehicle substantially similar to the speed indicated by the road test record.

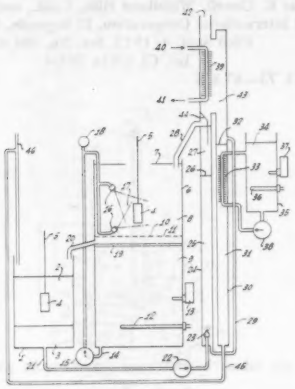
3,926,044

CLOSED-LOOP WATER-WASHABLE INSPECTION PENETRANT PROCESS

James R. Alburger, 5007 Hillard Ave., La Canada, Calif. 91011

Filed Jan. 11, 1974, Ser. No. 432,752
Int. Cl.² G01N 21/16
U.S. Cl. 73—104 2 Claims

1. In a water-washable inspection penetrant process in which a water-removable dyed liquid inspection penetrant is applied to a test surface and excess surface penetrant is removed by washing said test surface with water, leaving entrapments of said penetrant in any crack defects which are present, and leaving at least part of said penetrant in the form of a solution in said wash water, the improvement which permits recovery and re-use of both the wash water and penetrant dissolved in said wash water in which said penetrant is a non-surfactant-type low-solubility composition, and in which recovery of said penetrant is effected by the steps of (1) injecting said water solution of penetrant into a normally liquid water-insoluble volatile halocarbon solvent to provide for extracting said penetrant from said water solution, (2) separating said wash water from said volatile halocarbon by flotation, and (3) distilling said volatile halocarbon to separate said extracted penetrant.

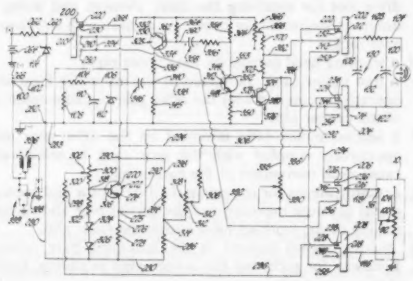


3,926,045

FLOW SENSOR AND SYSTEM

Gerald K. Miller, Hersey, Mich., assignor to Nartron Corporation, Reed City, Mich.

Filed Jan. 30, 1974, Ser. No. 437,926
Int. Cl.² G01M 15/00
U.S. Cl. 73—114 9 Claims



3. Electrical circuit means, for use in an automotive vehicle having a fluid-fuel consuming engine, for producing, in response to a plurality of variable input signals indicative of indicia of vehicle operation, a linear output signal corresponding to the distance-rate of consumption of said fuel, said electrical circuit means comprising first branch electrical circuit means effective for opening and closing related electrical output circuit means in timed relationship to the speed of operation of said engine for producing a first variable electrical signal indicative of engine speed, second branch electrical circuit means effective for producing a second variable electrical voltage signal the magnitude of which varies in a linear

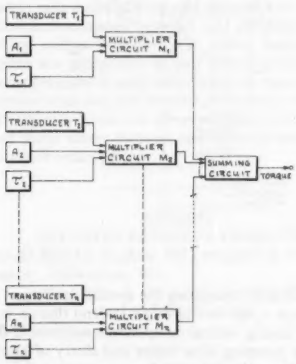
relationship with respect to the rate of flow of said fuel to said engine, electrical output means operatively connected to said output circuit means and adapted to be responsive to said second variable electrical signal, said output means being effectively acted upon by said second variable electrical signal whenever said output circuit means is closed in response to said first electrical signal for producing an output in response thereto; and operator actuatable switch means, said switch means having at least two operating positions one of which is effective to electrically disconnect said second branch electrical circuit means to thereby prevent the application of said second variable electrical signal to said output means.

3,926,046

SYSTEM FOR MEASURING UNSTEADY AERODYNAMIC TORQUES

Leonard J. Otten, III, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 8, 1974, Ser. No. 522,365
Int. Cl.[2] G01N 3/22
U.S. Cl. 73—133 R **2 Claims**



1. A system for determining the collective aerodynamic normal pressures in a cavity comprising:

a. a shell positioned inside the cavity;

b. a plurality of high response pressure transducers uniformly positioned about the shell, each transducer being associated with a predetermined area thereabout;

c. a plurality of signal sources associated with one each of the pressure transducers and indicating the particular area of interest about the transducer;

d. a plurality of multiplying circuits fed by one each of the pressure transducers and one each of the plurality of signal sources; and

e. a summing circuit fed by the plurality of multiplying circuits, the outputs indicating the collective pressure.

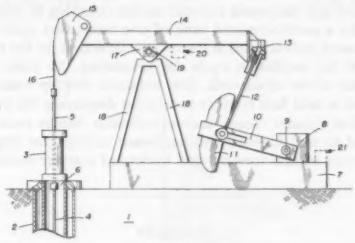
3,926,047

WELL PRODUCTION SIGNAL MEANS

Spencer E. Duke, Garland, and Gerald L. Stevens, Houston, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed June 15, 1972, Ser. No. 262,941
Int. Cl.[2] E21B 47/00
U.S. Cl. 73—151 **1 Claim**

1. In a well pumping unit containing a walking beam carried by a saddle bearing which in turn is supported by a sampson post, said walking beam being driven by a main shaft from a gear box, the improvement comprising a displacement trace signal means which produces a signal upon movement of a member of said signal means and without a cable-and-reel driven device, the character of said signal varying with the extent of movement of said member, said signal means is carried by said walking beam so that movement of said walking beam can cause movement of said movable member, a first elongate member having opposing first and second ends and fixed at its first end to said movable member, said first elongate member extending generally toward said sampson post-saddle bearing combination, said first elongate member terminates at its opposing second end intermediate said signal means and said combination, said second end of said first



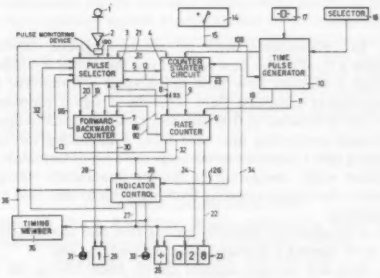
elongate means carries a swivel means, a second elongate means having opposing first and second ends and fixed at its first end to said sampson post, said opposing second end of said second elongate means being connected to said swivel means so that as said walking beam reciprocates up and down the movable member is moved by the restraint placed thereon by said first and second elongate means, and means for conducting said signal from said signal means to a receiving means.

3,926,048

DEVICE FOR THE DIGITAL INDICATION OF THE ACCURACY OF A MECHANICAL CLOCKWORK

Heinrich Uebelhart; Erich Schmid, and Paul Wyser, all of Itingen, Switzerland, assignors to Renata A.G., Itingen, Switzerland

Filed Dec. 12, 1972, Ser. No. 314,464
Int. Cl. G04d 7/12
U.S. Cl. 73—6 **2 Claims**



1. Apparatus for the digital indication of the accuracy of a mechanical clockwork comprising means for producing electrical signals in response to the periodic sounds produced in the clockwork, pulse selector means connected to the output of said electrical signal producing means for producing a first measuring pulse at the beginning of a measuring interval extending over several oscillations of the balance of the clockwork and a second measuring pulse at the end of the measuring interval, pulse monitoring means coupled between said means for producing said electrical signals and said pulse selector means, gate means located between the input and the output of said pulse monitoring means, means for blocking

said gate means until a predetermined time after the end of a measuring interval, means for producing timing signals, first counter means connected to said timing signal producing means and responsive to said first measuring pulse for starting a count at the beginning of said measuring interval and for terminating said count in response to the second measuring pulse, the count an said first counter means corresponding to the accuracy of the balance of the clockwork, forward and backward counter means for receiving said timing signals, means responsive to said electrical signals for staring said forward and backward counter means counting in one direction for a predetermined time of one oscillation cycle of the clockwork balance and in the reverse direction for the remainder of the oscillation cycle for measuring the poise of the balance of the clockwork, first indicator display means connected to said first counter means for displaying the count of said first counter means, second indicator display means connected to said forward and backward counter for displaying the count of said forward and backward counter means.

3,926,049
QUADRATURE-VOLTAGE BALANCING CIRCUIT OR ELECTROMAGNETIC FLOWMETER

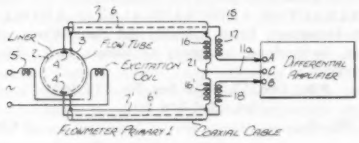
Albert Seebode, Rosdorf; Eggert Appel, Dransfeld, and Gottfried Geisler, Gottingen, all of Germany, assignors to Fischer & Porter Co., Warminster, Pa.

Filed Aug. 20, 1974, Ser. No. 499,014

Claims priority, application Germany, Nov. 3, 1973, 2355085

Int. Cl.² G01F *1/58*

U.S. Cl. 73—194 EM **8 Claims**



1. In combination with an electromagnetic flowmeter wherein a fluid whose flow rate is to be measured is conducted through a metallic flow tube to intersect a transverse alternatingcurrent magnetic field whereby a signal representing flow rate is induced in first and second diametrically-opposed electrodes projecting into said tube; a balancing circuit for coupling said electrodes to the respective input terminals of an amplifier while compensating for the quadrature voltage induced in the leads extending from said electrodes, said circuit comprising:

A. a transformer assembly having first and second sections each having a primary and a secondary, and

B. first and second coaxial cables each having an inner conductor surrounded by an outer shielding conductor, said first and second electrodes being respectively connected through said first and second inner conductors in series with the secondaries of said first and second sections to the input terminals of said amplifier, the primaries of said first and second sections being connected through said outer conductors to external points on the circumference of said metallic flow tube whereby quadrature voltage induced in said outer conductors and applied to said primaries acts in opposition to quadrature voltage induced in said inner conductors and applied to said secondaries, whereby the signal applied to said amplifier is substantially free of a quadrature voltage component.

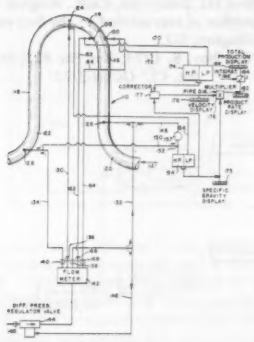
3,926,050
METHOD AND APPARATUS FOR DETERMINING SOLIDS DELIVERED FROM MOVING SLURRY

Thomas M. Turner, Severna Park, and Charles H. Scheid, Baltimore, both of Md., assignors to Ellicott Machine Corporation, Baltimore, Md.

Continuation-in-part of Ser. No. 367,865, June 7, 1973, abandoned, and Ser. No. 299,134, Oct. 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 218,760, Jan. 18, 1972, abandoned. This application Aug. 28, 1974, Ser. No. 501,297

Int. Cl.² G01N *9/26;* **G01F** *1/88*

U.S. Cl. 73—205 D **18 Claims**



4. The method of measuring the specific gravity of slurries moving through a pipe line having a U-bend therein including a pair of legs having vertical components comprising the steps of alternately pumping clear water and slurry of known specific gravity through said pipe line, measuring the pressure difference between a pair of vertically spaced positions in each of the respective legs when clear water and when said known slurry is moving in said pipeline, varying said positions, placing pressure taps at those vertically spaced positions of each leg where the pressure difference between said positions in each leg is equal for clear water and also equal for said known slurry, measuring the pressure differential between the average pressure at the upper of said taps and the average pressure at the lower of said taps of both legs when slurry of unknown specific gravity is flowing through the pipe line, and converting said pressure differential into a signal which is a function of the specific gravity of said slurry.

5. The method of claim 4 including, in addition, sensing the velocity of the slurry flow, deriving from said specific gravity reading the solids concentration in said slurry, and deriving the solid flow rate by multiplying the derived concentration by the sensed velocity of flow.

3,926,051
FROST PROTECTION PLUG FOR A WATER METER

Oded Katzman, Samech Vav St., No. 32, Kiryat Chaiim, Israel

Filed Jan. 2, 1975, Ser. No. 537,959

Int. Cl.² G01F *15/10*

U.S. Cl. 73—277 **6 Claims**

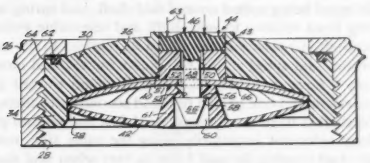
1. A frost protection plug assembly for a water meter, having inlet and outlet spuds connected respectively to inlet and outlet water conduits and an enlarged central portion providing a conventional water measuring unit and dial means to record the volume of water passing therethrough, said plug assembly comprising:

A. A main plug housing fixed as by screw threading into a through hole in a wall of said central portion, said main plug housing providing:

1. An annular outer cavity, and

2. A reduced diameter annular hole, coaxial therewith, extending between said cavity and an interior chamber of said central portion;

B. Spring means contained in said outer cavity in a normally tensioned condition;



C. Piston means normally in a slidable, sealed condition within said reduced diameter annular hole;

D. Connection means between said piston means and said spring means whereby said spring means and piston means are maintained in said normal positions when the water pressure in said water meter is maintained below a certain level and are ejected therefrom when said pressure level is exceeded to permit the water to drain from said water meter through said reduced diameter annular hole and outer cavity.

3,926,052

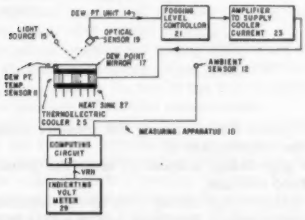
RELATIVE HUMIDITY COMPUTER

Jon Harold Bechtel, Goshen, Ind., assignor to Johnson Service Company, Milwaukee, Wis.

Filed May 6, 1974, Ser. No. 466,977

Int. Cl.[2] G01N *25/02*

U.S. Cl. 73—336.5 16 Claims



1. In a system for monitoring a condition of a given environment, a measuring apparatus comprising first sensing means for sensing a first parameter of the environment, second sensing means for sensing a second parameter of the environment, first amplifier means, input means for providing an input signal to said first amplifier means to enable said first amplifier means to provide an amplified output signal, said first and second sensing means being operable to control the gain of said first amplifier means whereby said output signal varies linearly with changes in the condition being monitored, said input means including second amplifier means for summing said output signal with a reference signal to provide said input signal for said first amplifier means.

3,926,053

APPARATUS FOR NON-CONTACT, ACCURATE AND CONTINUOUS DETERMINATION OF SURFACE TEMPERATURE ON A PART

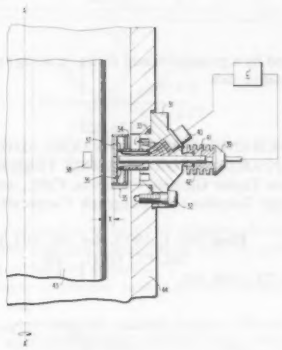
Josef Schurrer, Karlsfeld, and Josef Meyer, Olching, both of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Germany

Filed Aug. 22, 1973, Ser. No. 390,486

Claims priority, application Germany, Aug. 22, 1972, 2241107; Aug. 22, 1972, 2241108

Int. Cl.[2] G01K *13/08, 7/00*

U.S. Cl. 73—351 42 Claims



1. Apparatus for non-contact, accurate and continuous determination of the temperature on a surface comprising:

temperature detecting means,

and distance measuring means for continuously measuring the distance between said surface and said temperature detecting means,

wherein said temperature detecting means and said distance measuring means are arranged together to form a measuring probe spaced from said surface for simultaneously detecting the temperature of a spot on the surface and the distance of the probe from the spot, and

wherein signal line means are provided for said distance measuring means and said temperature detecting means for supplying signals representative of the instantaneous distance measured and temperature detected to analyser means positioned remotely of said probe, said analyser means compensating the detected temperature signal in accordance with the instantaneous distance signal so as to provide an accurate determination of the temperature of the spot on the surface.

3,926,054

GRAVITY GRADIOMETER

Sheldon W. Buck, Brookline, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Nov. 11, 1974, Ser. No. 522,635

Int. Cl.[2] G01V *7/00*

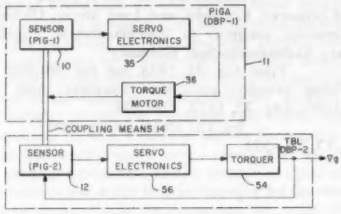
U.S. Cl. 73—382 23 Claims

1. A gravity gradiometer comprising:

A. first and second dynamically balanced pendulum (DBP), each including a sensor having perpendicular DBP input and output axes and a DBP sensitive axis, said DBP sensitive axis being perpendicular to said output axis and having a common intersection point with said input and output axes, wherein the sensitive axis of each sensor is parallel to a common gradiometer sensitive axis, and

B. a means for coupling said first and second sensors to rotate at related angular rates about their respective

sensitive axes, said angular rates being related to physical characteristics of said sensors, said sensors being separated by a predetermined distance along said gradiometer sensitive axis.

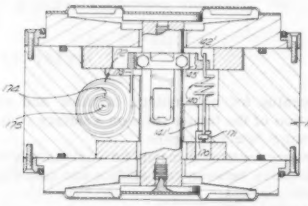


3,926,055

MECHANICAL SPAN AND ZERO ADJUSTMENT APPARATUS FOR PRESSURE TRANSDUCERS

Lawrence Taylor Garnett, Fullerton, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,336
Int. Cl.[2] G01L 7/08
U.S. Cl. 73—398 AR 28 Claims



1. Apparatus for producing an output in accordance with the pressure of a fluid, said apparatus comprising: a body having a portion with a hole extending all the way therethrough, said body portion having two openings into said hole at the respective opposite ends thereof; two diaphragms each having an annular part sealed and fixed relative to said body portion around a respective one of said two openings sealing both of said openings shut, said diaphragms being fixed relative to said body portion in a manner such that said annular parts lie in respective first and second parallel planes, a first side of each diaphragm facing the corresponding opening adjacent thereto, each diaphragm having a second side opposite said first side thereof; input means to supply fluid under pressure to the second side of one diaphragm, each of said diaphragms having a movable part to take a deflection in accordance with the magnitude of said fluid pressure, said movable part of said one diaphragm having a portion; connection means movable independent of said body, but holding said diaphragm portions in fixed positions relative to each other; a spring having first and second ends, said first end being fixed relative to one of said portions to bias the said one diaphragm in a direction normal to the plane thereof; span adjustment means selectively movable from a first position to a second, and vice versa, to fix said spring second end relative to and connect it to the other of said portions, and to disconnect said spring second end from said other portion, respectively, said spring being constructed and mounted to apply a force in a direction toward the first side of said one diaphragm when said span adjustment means is in said first position thereof; and output means connected from said one diaphragm portion to said body for producing an output which is a predetermined function of said fluid pressure.

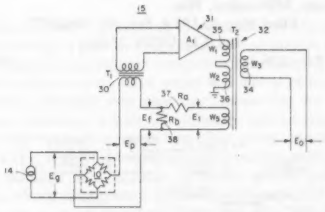
10. Apparatus for producing an output in accordance with the pressure of a fluid, said apparatus comprising: a body having a portion with an opening thereinto; a sensor having first and second sides and an annular part of said first side sealed to and fixed relative to said body portion around said opening; input means to supply fluid under pressure at least to a first predetermined one of said first and second sides of said sensor to cause deflection and movement of one portion thereof in accordance with said pressure; a spiral spring having inner and outer ends, said spring outer end being fixed relative to one of said sensor portions; a shaft rotatably mounted in a fixed axial position on the other of said portions, said spiral being coiled around said shaft, said spring inner end being fixed relative to said shaft; and releasable means to fix said shaft in a selected position of its rotation to the said other portion, said spiral spring being constructed and mounted to apply a force to said sensor in a direction toward a second predetermined one of said first and second sides thereof when said shaft is fixed as aforesaid, said first and second predetermined sides not necessarily being the same side, rotation of said shaft causing the said force to vary when said shaft is not fixed; and output means connected from said sensor portion to said body for producing an output which is a predetermined function of said fluid pressure.

3,926,056

CONDUCTIVITY, TEMPERATURE AND PRESSURE MEASURING SYSTEM

Neil L. Brown, Falmouth, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 26, 1974, Ser. No. 509,508
Int. Cl.[2] G01L 9/04
U.S. Cl. 73—398 AR 5 Claims



1. In a system for measuring the pressure within a fluid medium, the combination of

a strain gage bridge adapted to sense the pressure within said fluid medium,

said bridge being excited with an AC input signal of a known constant amplitude and of a kHz frequency;

a high-gain, multiple-stage amplifier having one of its stages tuned to said kHz frequency and having a negative feedback circuit;

means for connecting the bridge output circuit to the input circuit of said amplifier such that the negative feedback signal equals and opposes the bridge output signal whereby said bridge and amplifier operate as a self-balancing circuit,

the ratio of the amplitudes of the output signal of said amplifier and the A.C. input signal energizing said bridge when said balanced condition exists being proportional to the pressure then being sensed by said strain gage bridge; and

means for producing from said A.C. input signal and the output signal of said amplifier an n-bit binary signal indicative of the value of said ratio.

3,926,057

SPIRAL MANOMETER

Roy V. Baker, Lubbock, Tex., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sept. 26, 1974, Ser. No. 509,596
Int. Cl.² G01L 7/18
U.S. Cl. 73—401 9 Claims

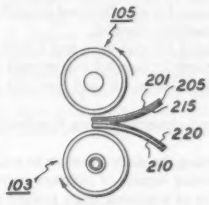
1. An apparatus for measuring pressure comprising:
a. a vertical cylindrical support tube comprising:
1. a spiral groove circumscribing the outer surface of the vertical cylinder from the top to the bottom in equidistant spirals,
2. a plurality of equidistant vertical lines for indexing, inscribed on the outer surface of the vertical cylinder substantially the full length thereof,
3. a plurality of equidistant horizontal rings inscribed around the circumference of the outer surface and spaced and numbered from the top to the bottom of the vertical cylinder for indicating vertical distance measurements,
4. an access hole located near the lower end of the vertical support cylinder to allow for access of
b. a transparent spiral tubing substantially of size and length to fit the spiral groove and attaching to
c. a fluid reservoir member, designed and located to fit inside the upper top section of the vertical support cylinder and comprising:
1. a standard connecting means for connecting the lower and upper of the spiral tubing,
2. an access opening for adding fluid to the reservoir,
3. a standard connecting means utilized as a low pressure port, located on the top of the fluid reservoir to allow for pressure differential measurement,
4. a yoke member affixed to the outer top circumference of the vertical support cylinder and used to support a standard connection fitting which is installed through the yoke in such a manner that the top end of the transparent spiral tubing can be connected to the bottom of the fitting and the top of the standard connection forms the high pressure port as well as a connecting device for pressure differential measurement,
5. a means of attaching the reservoir to a
6. top ring designed to fit and substantially form the top of the vertical cylinder, said top ring also having two holes for guide pins which function for alignment of the reservoir with the top ring,
d. a base member for support of the vertical cylinder comprising:
1. a round flat horizontal base piece with a male threaded center insert portion designed to fit the inside diameter of the female threaded vertical cylinder which is threaded on the inside diameter of the vertical cylinder thereby allowing the base to screw into the vertical support cylinder,
2. a level bubble attached to the upper surface of the round flat horizontal base piece to allow for visual leveling of the entire device,
3. a leveling means.

3,926,058

CONTACT ARC REPLICATION DEVICE

Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 12, 1974, Ser. No. 532,083
Int. Cl.² G01D 21/00
U.S. Cl. 73—432 R 6 Claims



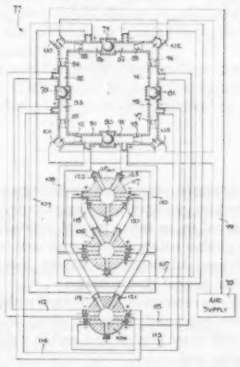
1. A device for measuring heat and pressure characteristics of a nip between pressure heated fusing rolls comprising:
a first sheet of support material,
a uniform layer of silicone rubber bonded to said support material, and
a layer of toner material coated on said silicone rubber whereby upon positioning a second sheet of unmarked support material in overlying contact with said toner layer and insertion of the sheets between pressure heated fusing rolls for a predetermined time and separation of the sheets, a portion of the toner pattern is offset from said silicone rubber layer onto said second sheet immediately indicating heat and pressure characteristics of the nip.

3,926,059

ACCELEROMETER

Vernon R. Fish, 525 Meadowbrook Ave., Orange, Calif. 92665

Division of Ser. No. 277,676, Aug. 3, 1972, Pat. No. 3,804,471.
This application Apr. 15, 1974, Ser. No. 460,993
Int. Cl.² G01P 15/02
U.S. Cl. 73—510 1 Claim



1. An accelerometer comprising
first, second, third and fourth seismic masses,

said masses being of equal size, shape and mass,

a pair of chambers positioned one on either side of each of said masses,

each of said chambers including an outlet opening facing the adjacent seismic masses,

said outlet openings being opposed and axially aligned for each of said seismic masses,

a source of pressurized fluid for providing fluid streams discharging through said outlet openings,

whereby each of said masses is suspended between opposed fluid streams and is movable toward and away from the adjacent outlet openings,

said fluid streams for said first and second seismic masses being substantially parallel,

said fluid streams for said third and fourth seismic masses being substantially parallel and normal to the direction of said fluid streams for said first and second seismic masses,

said masses and chambers being in substantially a square pattern,

means for detecting the static pressure in each of said chambers for obtaining signals of pressure increase from relative movement of a seismic mass toward an outlet opening and of pressure decrease from relative movement of a seismic mass away from an outlet opening as a result of angular deceleration of said chambers, and means for adding said signals so as to obtain a composite output signal proportional to angular acceleration.

3,926,060

GYROSCOPIC APPARATUS

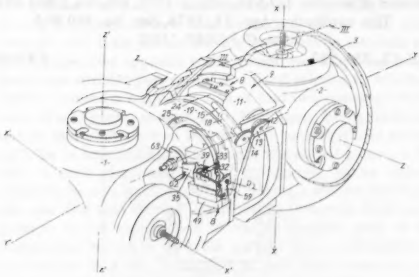
Barrie Andrew Gillies, Crowthorne, and Frederick Granville Simpson, Woodley, both of England, assignors to Sperry Rand Limited, Bracknell, England

Filed May 10, 1973, Ser. No. 359,049

Claims priority, application United Kingdom, May 12, 1973, 22475/73

Int. Cl. G01c *19/24, 19/26*

U.S. Cl. 74—5.1 **20 Claims**



1. In a gyroscopic apparatus including at least one two-degree-of-freedom gyroscope having an outer case, a sensitive element mounted in an inner gimbal rotatable about an axis and an outer gimbal rotatable about an axis orthogonal to the inner gimbal axis, an improved caging mechanism for said inner and outer gimbal comprising,

a releasably operable plunger oriented within an attached to said outer case and movable along a line that passes through the inner gimbal axis and is parallel to the outer gimbal axis, and

inner gimbal extension means positioned along the inner gimbal axis for coacting with said plunger whereby said plunger engages said extension means thereby accurately caging said inner and outer gimbals simultaneously in a specified position.

3,926,061

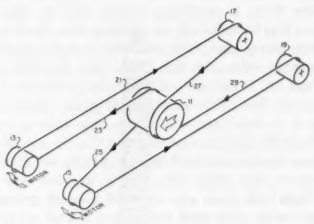
DIFFERENTIAL DRIVE ROTATING DISC IMPACT PRINTER

Gary L. Paulson, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 2, 1974, Ser. No. 511,339

Int. Cl.[2] F16H *21/00, 7/00;* **B41J** *1/32, 19/00*

U.S. Cl. 74—22 R **8 Claims**



1. A differential drive system comprising:

a support;

first and second drive means fixedly mounted on said support for providing rotational motion;

moving means movably positioned for rotational and translational motion with respect to said support; and

linking means interconnected between said first and second drive means and said moving means for transmitting forces and torques therebetween, said moving means thereby undergoing motion having rotational and translational components whose magnitudes and directions depend on the relative magnitudes and directions of the rotational motions of said first and second drive means.

3,926,062

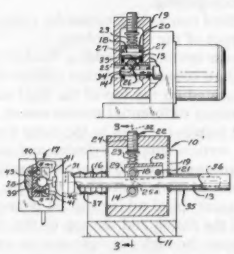
LINEAR MEASURING APPARATUS

Frederick R. Neff, Des Plaines, Ill., assignor to A & A Engineering Co., Franklin Park, Ill.

Filed Oct. 24, 1973, Ser. No. 409,175

Int. Cl. F16h *27/02*

U.S. Cl. 74—89 **21 Claims**



1. Apparatus for providing a rotary output corresponding accurately to linear movement of a movable member, comprising: a cylindrical output roller; means supporting said roller for rotation about an axis of rotation; an elongated actuator element having a circular cross section; holding means for positioning the actuator element in point contact engagement with said output roller and extending substantially normally to the axis thereof; means applying a pressure force against said actuator element, said force acting through said actuator element and against said output roller through said point contact at a position spaced from said one end for causing the actuator element to be forcibly urged against said output roller whereby said actuator element has effectively positive driving engagement with said output roller, said force

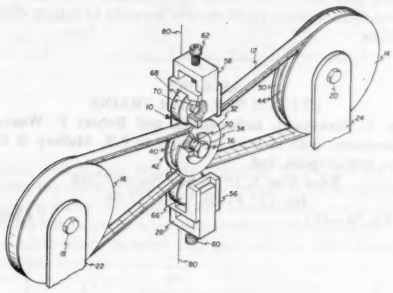
applying means concurrently adjustably constricting said output roller relative to said axis of rotation to adjust the amount of rotation thereof effected by longitudinal movement of said actuator element; and means for causing relative movement between the output roller and the actuator element to effect a rolling of the output roller along the longitudinal extent of the actuator element corresponding to linear movement of the movable member.

3,926,063

FLOATING IDLER PULLEY APPARATUS

Leonard E. Mayfield, B-7 Rocket Mobile Village, Alamogordo, N. Mex. 88310

Filed Dec. 9, 1974, Ser. No. 530,546
Int. Cl.² F16H 7/12, 7/00, 7/10
U.S. Cl. 74—242.11 A 9 Claims



1. A floating idler tensioner for a drivable band having a driving portion and a driven portion, said band engaging at least one driven wheel and one driving wheel, said tensioner being supportable solely by said band, said tensioner comprising:

a housing having a longitudinal axis;

central means for frictionally engaging said drivable band rotatably attached to said housing and having an axis of rotation perpendicular to said longitudinal axis;

first rotatable and adjustable tension imposing means for frictionally engaging said drivable band on said driving portion of said band having an axis of rotation essentially perpendicular to said longitudinal axis and parallel to said axis of rotation of said central means; and

second rotatable and adjustable tension imposing means for frictionally engaging said drivable band on said driven portion of said band having an axis of rotation essentially perpendicular to said longitudinal axis and parallel to said axis of rotation of said central means.

3,926,064

GEAR TRANSMISSION REDUCTION FOR DIVISION OF POWER

Francois Durand, 11 rue du Bateau, 06 Antibes, France

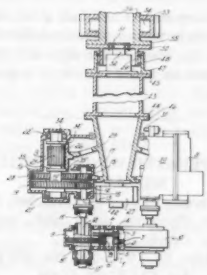
Filed Jan. 2, 1974, Ser. No. 430,226
Claims priority, application France, Sept. 21, 1973, 73.35920
Int. Cl.² F16H 1/20, 37/06, 1/06
U.S. Cl. 74—421 R 7 Claims

1. A gear reduction device for driving a single output gear at four spaced locations about the output gear's periphery from a single input shaft, said device comprising

first and second gear shafts, each of said first and second gear shafts being connected through a gear with said input shaft such that the power input to said input shaft is equally divided between said first and second gear shafts,

two helical pinions of reverse pitches mounted on each of said first and second gear shafts,

a pair of drive gear shafts connected with each of said first and second gear shafts through respective pairs of said pinions carried on said first and second gear shafts, one of said pair of pinions on said first gear shaft being adapted to drive one of each pair of said drive gear shafts associated with that first gear shaft and the other of said pair of said pinions on said first gear shaft being adapted to drive the other of that same pair of said drive gear shafts associated with that same gear shaft, and one of said pair of pinions on said second gear shaft being adapted to drive one of each pair of said drive gear shafts associated with that second gear shaft and the other of said pair of pinions on said second gear shaft being adapted to drive the other of that same pair of said drive gear shafts associated with that same second gear shaft, said connections being such that the power input to each pair of said drive gear shafts from each of said first and second gear shafts is equally divided therebetween, and



a pinion drive gear fixed to each of said drive gear shafts, all four of said pinion drive gears being simultaneously meshed with said single output gear,

said device initially subdividing an input torque into four equal and separate torques, and subsequently regrouping those torques on said single output gear continuously during operation of said device.

4. A device as set forth in claim 1 including

a first housing independent of said output gear, said first housing carrying a portion of said first and second gear shafts, and said first housing also carrying said input gear,

a second housing for said drive gear shafts, said second housing also carrying a portion of said first and second gear shafts, and said second housing being independent of said first housing, and

a gear coupler interconnecting that portion of each first and second gear shaft carried by said first housing with that portion of that same gear shaft carried by said second housing.

3,926,065

BEVEL AND RING GEAR DRIVE

Robert S. Summers, 9190 Baseline, Alta Loma, Calif. 91701, and William R. Summers, 2105 Bonita, Ontario, Calif. 91761

Filed June 26, 1974, Ser. No. 483,133
Int. Cl.² F16H 1/14, 1/20
U.S. Cl. 74—424 2 Claims

1. A bevel ring gear component comprising:

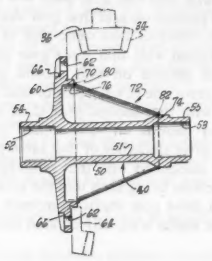
an elongate generally circular hub,

web means surrounding and extending radially out from said hub in a plane transverse to and spaced a distance from one end of the hub,

a bevel ring gear disposed circumferentially about and rigid on said web means and having a circular row of bevel gear

teeth coaxial with and facing said one end of said web, and

bracing means extending between and rigidly joined to said web means closely adjacent said ring gear and to said one hub end in a manner such that said bracing means extends



between said web means and hub at an oblique angle to the hub and acts in tension to resist deflection of said web means in the direction of the opposite end of said hub under the thrust in said direction of a gear mating with said ring gear.

3,926,066

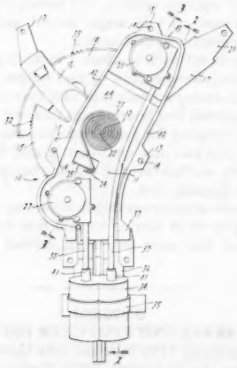
POWER OPERATED WINDOW REGULATOR MECHANISM

Floyd N. Ladd, Warren; Marcel R. Raveschot, Allen Park, and Donald G. Stacy, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 28, 1974, Ser. No. 473,864

Int. Cl.² F16H *55/04*

U.S. Cl. 74—435 **2 Claims**



1. A window regulator mechanism for raising and lowering adjacent movable sections of a divided window panel,

the window regulator mechanism comprising:

an elongated mounting plate,

a pair of gear sectors rotatably superposed on a common pivot shaft journalled in the mounting plate intermediate the ends of the latter,

each gear sector having a regulator arm fixed thereto adapted to be coupled to one of the window panel sections,

independent reduction gear units located at opposite ends of the mounting plate, each coupled to a respective gear sector,

the reduction gear units being mounted on one face of the mounting plate and the gear sectors driven thereby being proximate to the opposite face,

the reduction gear units each having a drive pinion projecting through an aperture in the plate to mesh with a respective gear sector,

a drive cable means coupled to each reduction gear unit,

and an electric drive motor coupled to each drive cable means,

the drive motors being positioned in parallel relationship within a common casing carried on a support bracket attached to one end of the mounting plate,

the drive cables extending from parallel output shafts at the same ends of the drive motors to the reduction gear units, the drive motors being independently operable to rotate the gear sectors to swing the regulator arms independently in window panel section lowering or raising directions.

3,926,067

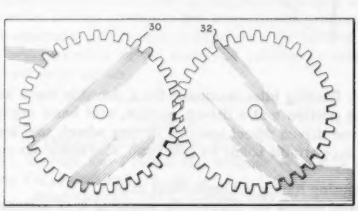
CLUTCH FOR GEAR TRAINS

James S. Blanchard, Indianapolis, and Robert F. Weaver, Jamestown, both of Ind., assignors to P.R. Mallory & Co. Inc., Indianapolis, Ind.

Filed May 6, 1974, Ser. No. 467,388

Int. Cl.² F16H *55/14*, *57/00*

U.S. Cl. 74—461 **7 Claims**



1. In a gear train that includes a first gear rotatably carried by a housing, a second gear rotatably carried by said housing and in running engagement with said first gear, an improved clutch comprising:

a. first gear teeth disposed on said first gear; and

b. second gear teeth disposed on said second gear adapted for operating in running engagement with said first gear teeth and having sufficient flexibility to permit deflection past said first gear teeth upon impediment of rotation of one of said first and second gears;

c. whereby said first and second gears can run together in a normal gear-to-gear fashion or slip past one another in a clutching fashion.

3,926,068

SHIFTING LINKAGE FOR SHIFTING CHANGE-SPEED TRANSMISSIONS

Hermann Jantzen, Hannover; Karl Kuffel, Kassel, and Herbert Puchta, Elgershausen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed May 31, 1974, Ser. No. 475,176

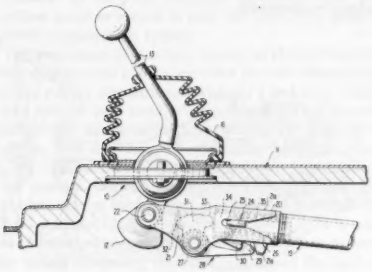
Claims priority, application Germany, June 2, 1973, 2328230

Int. Cl.² G05G *9/12*, *9/16*

U.S. Cl. 74—473 R **28 Claims**

1. A shifting linkage for vehicles having a change-speed transmission and including a shifting lever means for shifting the transmission, the shifting lever means being supported in a portion of the vehicle accommodating the driver, and tele-

scopic means for connecting the shift lever means with the transmission, the telescopic means being operable to be locked in a contracted position, characterized in that the telescopic means includes at least one inner telescopic member and at least one outer telescopic member, one of said inner and outer telescopic members being operatively connected with a part pivotally engaging at the shifting lever means, the other of said telescopic members being operatively connected with the change-speed transmission, and in that the locking action of the telescopic means in the contracted position takes place between said part and the other telescopic member.



3,926,069

BREAKAWAY UNIVERSAL JOINT ASSEMBLY

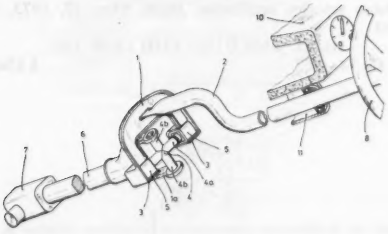
Josef Wenninger, Vorsfelde, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Oct. 18, 1974, Ser. No. 515,982

Claims priority, application Germany, Oct. 30, 1973, 2354165

Int. Cl.² B62D *1/16*

U.S. Cl. 74—492 **5 Claims**



1. In a safety steering column for a vehicle having a steering wheel assembly and a steering gear assembly, the steering column extending between the steering wheel assembly and the steering gear assembly, the improvement comprising a breakaway universal joint assembly that includes a spider having four arms disposed in a cross-like configuration, a first yoke releasably coupled to a first two opposed arms of the spider, and a second yoke coupled to a second two opposed arms of the spider, the first yoke being adapted to release the first two opposed arms in response to a load exerted on the joint assembly which exceeds a predetermined load and which is exerted in a direction generally parallel to a longitudinal axis of the steering column.

3,926,070

RACK-AND-PINION STEERING GEAR BOX INCORPORATING A DAMPER FOR MOTOR VEHICLES

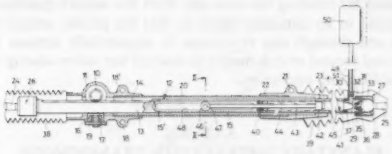
Giuseppe Busso, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Sept. 7, 1973, Ser. No. 395,342

Claims priority, application Italy, Sept. 8, 1972, 28977/72

Int. Cl. B62D *3/12*

U.S. Cl. 74—498 **6 Claims**



1. A rack-and-pinion steering-gear box for motor vehicles wherein a straight toothed rod is controlled to slide within a fixed tubular body by the rotation of a pinion, comprising aa two-membered hydraulic damper located inside an axially directed cavity of a hollow portion of said rod, said damper having a piston and a cylinder, which are respectively movable with a rectilinear motion along the axis of movement of said rod, the members of said damper being contained in the interior of said fixed body, one member being fastened to said body and the other to said rod.

3,926,071

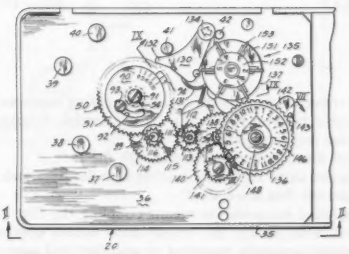
CONTROL DEVICE

Eugene R. Elliott, Libertyville, Ill., assignor to Culligan International Company, Northbrook, Ill.

Filed Nov. 4, 1974, Ser. No. 520,468

Int. Cl.² F16H *53/00*, *55/04*; G06M *3/00*

U.S. Cl. 74—567 **27 Claims**



1. A device for controlling actuation of valves of a liquid treatment apparatus during a reconditioning operation performed thereon, comprising a support; a compound cam unit mounted on said support for rotation, said cam unit including a driven gear having a cut-out segment in its periphery, a center member attached to the driven gear to rotate therewith, a segment member, and means for adjustably interconnecting the segment member and the center member, said center member and segment member each having a partial crylindrical surface, at least one of said partial cylindrical surfaces having axially spaced portions of different arcuate lengths, said interconnecting means positioning the cylindrical surface of the segment member in overlapping relation with a portion of the cylindrical surface of the center member so that said partial cylindrical surfaces coact to form a first and second cylindrical cam surfaces which are axially spaced and have different arcuate lengths, said interconnecting means enabling relative rotation between said members to vary the lengths of both cam surfaces; first and second means for controlling actuation of a valve with each means having cam

followers, said first and second means being mounted on the support with their cam followers engaging the first and second cam surfaces as the cam unit is in a service position; a motor mounted on said support; a pinion driven by said motor; means for mounting the pinion at the cut-out segment of the driven gear when the cam unit assumes the service position, said means for mounting enabling yielding of the pinion gear relative to the driven gear to enable mesh engagement therewith as the driven gear is rotated from the service position; and means engageable with the cam unit when in the service position for rotating the cam unit from the service position in response to an initiating signal so that the pinion rotates the cam unit through one revolution to sequentially actuate the first and second switch means to control the valves during the reconditioning operation.

3,926,072

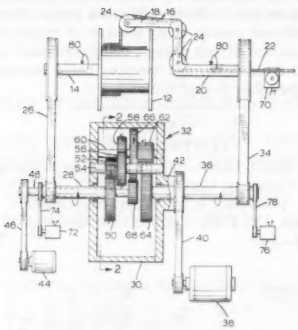
PLANETARY DIFFERENTIAL TRANSMISSION

Walter Lorne Richardson, Pointe Claire, Canada, assignor to Northern Eelectric Company Limited,, Montreal, Canada

Filed Oct. 24, 1974, Ser. No. 517,496

Int. Cl.² F16H *37/06;* **7/24** *07/24;* **D01H** *13/00*

U.S. Cl. 74—665 N **9 Claims**



1. A drive mechanism for a cable stranding machine having a rotatable take-up reel and a flyer rotatable concentrically about the reel, comprising:

A first drive shaft connectable with the reel;

A second drive shaft connectable with the flyer and coaxial with the first drive shaft;

differential transmission means coupling the first and second drive shafts, the transmission means comprising a housing journally mounted on said first and second drive shafts and gear means interengaging said shafts;

first drive means rotating the housing; and

second drive means engaging the gear means whereby the relative rotation of the first and second drive shafts is variably controllable.

3,926,073

AUTOMATIC TRANSMISSIONS WITH PLANETARY GEARS HAVING A BRAKING MECHANISM CAPABLE OF BEING PRE-ASSEMBLED

Jean Claude Roche, Rueil-Malmaison; Martial Lavarec, Paris, and Jean Maurice, St. Germain de la Grange, all of France, assignors to Regie Nationale des Usines Renault and Societe dite: Automobiles Peugeot, both of Paris, France

Filed Jan. 31, 1974, Ser. No. 438,402

Int. Cl.² F16H *57/10, 03/44*

U.S. Cl. 74—753 **4 Claims**

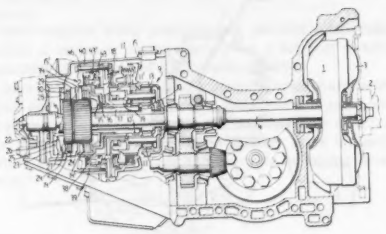
1. An automatic transmission having a planetary gear train and braking and clutching mechanisms associated with the elements of the planetary gear train comprising:

a housing;

coaxially disposed means provided within said housing, hydraulically controlled by means of spring biased pistons, for actuating said braking and clutching mechanisms for said elements of said planetary gear train;

a bulkhead forming the bearing for a free wheel and connected to said housing;

channel means for the distribution of hydraulic fluid to said braking mechanisms;



a brake casing fixed to said bulkhead; and

friction discs disposed within said casing,

said casing including a single portion projecting radially inwardly towards the longitudinal axis thereof so as to form a supporting surface for said friction discs, and wherein the periphery of said casing includes first means for securing said casing to said housing and second means for securing said casing to said bulkhead, internal wall portions of said casing forming seat means for said piston springs which are secured between said single radially inward portion of said casing and radially extending portion of said pistons.

3,926,074

RESONANCE PREVENTIVE SYSTEM FOR POWER TRANSMISSION SYSTEMS OF INTERNAL COMBUSTION ENGINES

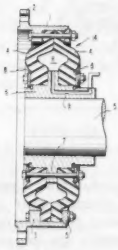
Eisuke Sugahara, Tokyo, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1974, Ser. No. 455,086

Claims priority, application Japan, Mar. 27, 1973, 48-35203

Int. Cl.² B60K *21/00;* **F16D** *23/10, 3/80*

U.S. Cl. 74—857 **6 Claims**



1. A resonance preventive system for use with a power transmission system of an internal combustion engine, said resonance preventive system comprising:

a fluid coupling with variable torsional rigidity disposed midway of the power transmission system between input and output transmission system elements, said coupling comprising a hollow annular rubber member means

fixedly coupled between said input and output elements and forming a fluid pressure chamber therebetween;

means for detecting the rotative speed and/or the applied load on said engine and for producing a signal indicative thereof; and

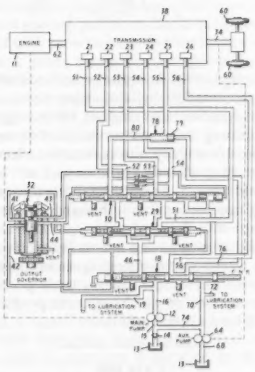
control means responsive to said signal for supplying a control fluid whose pressure and flow rate varies in accordance with variance of said signal to said fluid coupling chamber to vary the torsional rigidity of said annular rubber member means to shift the resonance point of the power transmission system.

3. The resonance preventive system as claimed in claim 1, wherein said annular rubber member means comprises a pair of annular rubber elements and wherein a hub is of a diameter less than that of said annular casing, and means secure said annular rubber elements at their peripheries respectively to said casing and said hub, means mount said hub and said casing to respective elements of said power transmission system for rotation under torisonal restraint provided by said rubber elements, at least one of said annular elements defines said fluid pressure chamber and said control fluid is supplied to said chamber, whereby, said fluid coupling has its torsional rigidity varied depending upon the pressure of the fluid within said chamber.

3,926,075
VEHICLE AUTOMATIC TRANSMISSION HAVING PUSH START CAPABILITY

Victor Kronstadt, Hagerstown, Md., assignor to Mack Trucks, Inc., Allentown, Pa.

Filed Oct. 18, 1974, Ser. No. 515,832
Int. Cl.² B60K *41/00*
U.S. Cl. 74—867 8 Claims

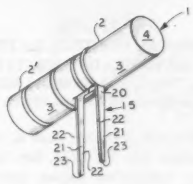


1. A vehicle automatic transmission comprising an input shaft adapted to be coupled to the vehicle engine, an output shaft adapted to be coupled to the driven wheels of the vehicle, drive means connecting the input shaft to the output shaft with an adjustable transmission ratio, automatic control means for adjusting the transmission ratio of the drive means, a first pump adapted to be driven by the vehicle engine for delivering pressurized liquid to the automatic control means, means for selecting a predetermined transmission ratio of the drive means, a second pump driven by the output shaft for delivering pressurized liquid to energize the selecting means so as to select the predetermined transmission ratio, and means for selectively communicating the output of the second pump with the selecting means independently of the automatic control means, whereby the vehicle engine may be started by moving the vehicle so as to drive the engine from the wheels at the predetermined transmission ratio, the automatic control means exerting no control over the transmission ratio of the drive means before the engine is started.

3,926,076
CORK PULLER

Bolesław Szumacher, 2708 N. Richmond Ave., Chicago, Ill. 60647

Filed Apr. 14, 1975, Ser. No. 567,518
Int. Cl.² B67B *7/06*
U.S. Cl. 81—3.41 10 Claims

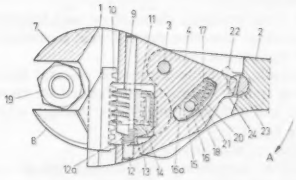


1. A cork puller comprising a puller element and a pair of telescoping inner and outer handle sections, said element adapted to fit lengthwise into said handle sections, interengaging detent means on said sections, said element having portions biasing and maintaining said detent means in releasable interengaged relationship.

3,926,077
COMBINED ADJUSTABLE SPANNER AND RATCHET WRENCH

Simon Nils Nordgren, 14, Centralvagen, Rimbo, Sweden

Filed Nov. 16, 1973, Ser. No. 416,346
Claims priority, application Sweden, June 28, 1973, 7309170
Int. Cl.² B25B *13/16*
U.S. Cl. 81—126 7 Claims



1. A combined adjustable spanner and ratchet wrench adapted to clamp and turn a work piece when turned in the working direction and to slide on the work piece without turning the same when turned in the return direction opposite to the working direction, said wrench comprising a wrench head having a fixed jaw and a moveable jaw, means for setting the moveable jaw including a rack on the moveable jaw and a worm engaging said rack and displaceable axially between two limitary positions including a working position, a handle having a fork-like construction at one end provided by a pair of legs, said wrench head having a tongue projecting centrally therefrom and being embraced by said legs of said fork-like end of said handle, axle means perpendicular to the main plane of the wrench received in said wrench head and said handle for pivotally joining the same, locking means for retaining said worm in its working position when said handle is actuated in the working direction and to release said worm for axial displacement from its working position when said handle is moved in its return direction, said tongue having an opening formed therein, and a stem extending perpendicular to the main plain of the wrench passing through said opening in said

tongue between said legs of said fork-like end of said handle, said stem being supported at its ends on said legs of said fork-like end of said handle, said stem being positioned to engage the edge contour of said opening to limit the swinging movement of said wrench head and said handle reciprocally, said stem being positioned, with said worm in its working position, to take a stop position fixed by the edge contour of said opening by bearing on said edge contour during turning of the wrench in the working direction to turn a work piece so that said stem positively urges the wrench head in the working direction by direct contact with the edge contour of said opening.

3,926,078
NUMERICAL CONTROL LATHE OF SLIDING-HEADSTOCK TYPE

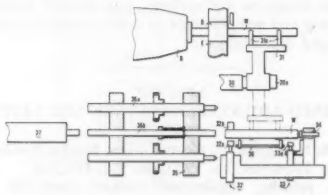
Shinichi Ishizuka, Tokyo, and Kuniyuki Mihara, Tachikawa, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 367,389, June 6, 1973, abandoned. This application Jan. 10, 1975, Ser. No. 539,995

Claims priority, application Japan, June 10, 1972, 47-57819; June 14, 1972, 47-59139; Oct. 17, 1972, 47-103863; Apr. 20, 1973, 48-4496

Int. Cl.² B23B *13/00*

U.S. Cl. 82—2.5 **5 Claims**



1. A numerical control lathe of the sliding-headstock type comprising:

an elongated bed;

a headstock reciprocatingly disposed on said bed for travel in a longitudinal direction thereof, said headstock being advanced by numeric control;

a driving spindle rotatably supported on said headstock, said driving spindle having a collet chuck for clamping a workpiece and a throughgoing bore through which said workpiece is fed;

a spindle head on said driving spindle;

means rotatably supporting said driving spindle on said headstock close to said spindle head;

a guide bush situated coaxially with the axis of said driving spindle so as to rotatably support the workpiece;

a pedestal for supporting said guide bush and detachably mounted on said bed;

a first turret toolpost having a slide block driven in numeric control, said slide block being movable in a direction perpendicular to the axis of said driving spindle;

another turret toolpost having a slide block driven by an oil pressure cylinder, this slide block being movable in a direction parallel to the axis of said driving spindle;

a turret head mounted on said first turret toolpost, the slide block of the latter being movable in a direction perpendicular to the axis of said driving spindle, said turret head being rotatably supported on said slide block alongside said guide bush with the rotation axis of said turret head being parallel to the axis of said driving spindle;

a portal housing block spanned over said driving spindle and mounted on said bed;

a guide rail located on said housing block in a direction perpendicular to the axis of said driving spindle, said slide block of said first turret toolpost being movable along said guide rail;

an oil pressure actuator for pushing said slide block toward said driving spindle; and

a device for adjusting progressive advance of tools attached to said turret head for exactly guiding the respective ends of the tools to a cutting position defined near said guide bush even where the tools have different lengths.

3,926,079
MACHINE TOOLS

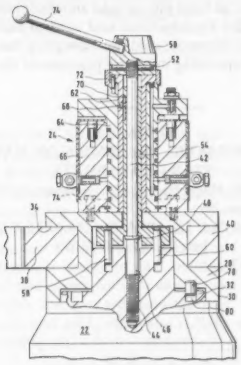
Reginald Francis Johnson, Leicester; Thomas James Potts, Derby, and Gordon Bridgman Jennings, Nottingham, all of England, assignors to Rolls-Royce (1971) Limited, London, England

Filed Mar. 18, 1975, Ser. No. 559,426

Claims priority, application United Kingdom, Mar. 22, 1974, 12852/74

Int. Cl.² B23B *29/00*

U.S. Cl. 82—36 A **9 Claims**



1. A turret adapted for traversable and rotatable mounting on a machine tool saddle, wherein said turret comprises an assembly of a rotatable base adapted for the rigid holding of a plurality of cutting tools and surmounted by a pair of relatively rotatable, electrically non-conductive sleeves arranged one within the other about a common axis of rotation which is normal to said base, and sleeve retaining means, one of said sleeves having connections and passages for the receipt and passage of respective flows of water, gas and electricity and the other of said sleeves having means for receiving said flows from said one sleeve and re-directing them to positions adjacent a respective one of the cutting tools positions on said rotatable base at each of which adjacent positions in operation, there will be a plasma gun.

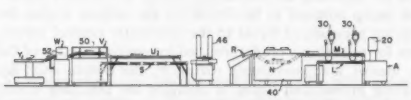
3,926,080
APPARATUS FOR AND METHOD OF PROCESSING MEAT PRODUCTS

Louis A. Bettcher, Amherst, Ohio, assignor to Bettcher Industries, Inc., Birmingham, Ohio

Filed Sept. 10, 1973, Ser. No. 395,859

Int. Cl.² B26D *7/08*

U.S. Cl. 83—15 **5 Claims**



1. The method of subdividing a comestible body which comprises the step of immersing the comestible body in liquid nitrogen to crust freeze the same, removing the crust frozen

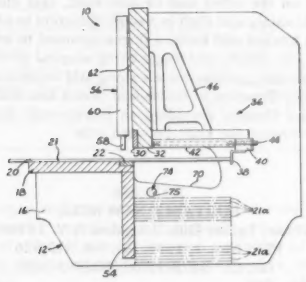
body from the liquid nitrogen and while so frozen severing the body into smaller parts.

3,926,081

BACK GAUGE WARNING SYSTEM FOR SHEARS AND THE LIKE

Verne W. Roberts, 5021 Glendale Drive, Gurnee, Ill. 60031

Filed Dec. 9, 1974, Ser. No. 530,722
Int. Cl.² B26D 7/16, 7/22
U.S. Cl. 83—96 5 Claims



1. In a shear or the like having frame means, means defining a generally horizontal support surface along which a workpiece may be moved preparatory to shearing the workpiece, cutter means supported by said frame means and having a cutting edge movable between a first position spaced above the plane of said support surface and a second position spaced below the plane of said support surface so as to shear a workpiece underlying said cutting edge when moved from its said first to its said second positions, back gauge means disposed rearwardly of said cutter means and movable with said cutting edge, said back gauge means being disposed to provide a stop against which the leading edge of a workpiece may abut to establish a predetermined length of the workpiece to be sheared by said cutting edge, said frame means defining a receiving area below said cutter means and said back gauge means to receive severed portions of workpieces which may progressively stack up, and drive means operative to effect selective movement of said cutter means and back gauge means between their said first and second positions; the combination therewith comprising safety means operatively associated with said frame means and adapted to detect the presence of stacked severed workpiece portions at a predetermined height in said receiving area below said cutter means and said back gauge means, said safety means including means for providing a signal when the stack of severed workpiece portions in said receiving area reaches said predetermined height such that an operator is notified to remove severed workpiece portions from below said cutting means and back gauge means before said stack reaches a height sufficient to be engaged by said back gauge means.

3,926,082

PUNCHING DEVICE HAVING ADJUSTABLE GUIDE RETAINER

Vitmar G. von Langendorff, Tonawanda, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Feb. 14, 1975, Ser. No. 550,759
Int. Cl.² B26D 7/22, 1/06
U.S. Cl. 83—140 10 Claims

1. A punching device comprising:

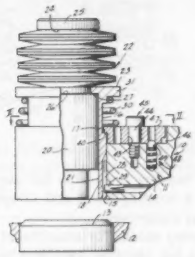
a. a frame having a lower arm on which a die is supported, and an upper arm having a vertical bore aligned therewith;

b. a punch-guide and stripper sleeve slidably disposed in the bore in said upper arm, there being a recess facing said bore and defining a shoulder facing away from said die;

c. a punch having a body slidably disposed in said sleeve;

d. a stripping spring acting between said sleeve and said punch to urge the lower end of said punch into said sleeve;

e. a lifting spring acting between said sleeve and said upper arm and urging said sleeve away from said die; and



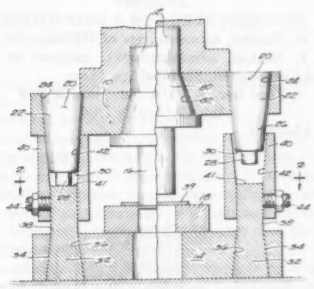
f. a retainer plate movably secured to the upper side of said upper arm, said plate having a plurality of peripheral portions for overhanging said bore and projecting into said recess of said sleeve, said portions each having a shoulder (1) facing toward said die, (2) being located at differing distances from said die, and (3) being respectively engageable with said shoulder on said sleeve in response to horizontal repositioning of said plate.

3,926,083

DIE SET WITH TWO-PART LEADER PINS

Kasimir Janiszewski, 11908 W. Loomis Road, Franklin, Wis. 53132

Filed Sept. 20, 1974, Ser. No. 507,637
Int. Cl.² B26D 5/20; F16C 29/02
U.S. Cl. 83—637 9 Claims



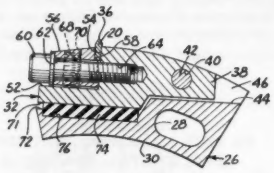
1. In a die set including a punch holder and a die shoe, the improvement comprising an upper leader pin portion mounted on said punch holder and having a tapered surface decreasing in diameter remote from said punch holder, a lower leader pin portion anchored in said die shoe and having a tapered bore complementary to said tapered surface of said leader pin and adapted to telescopically and reciprocally receive said upper leader pin tapered portion and guide said punch holder during reciprocal movement of said punch holder and leader pin toward and away from said die shoe.

3,926,084

KNIFE HOLDING APPARATUS

Cedric W. Blazer, Rockford, Ill., assignor to Zenith Cutter Company, Rockford, Ill.

Filed Nov. 21, 1974, Ser. No. 525,723
Int. Cl.[2] B23D *25/12;* **B26D** *1/56, 1/36*
U.S. Cl. 83—698 **11 Claims**



1. A knife holding apparatus for use with a slotting head mounted on a rotating shaft and cooperating anvil surface, said apparatus comprising:

a block having means for attachment to said cutting head; a holding bar pivotally attached to said block and movable through a limited arc, said bar having generally vertical and horizontal contact surfaces at one end thereof, said vertical contact surface being adapted to cooperate in holding an elongated cutting knife, the cutting edge of which extends upwardly beyond the general surface of the bar and block;

said bar having a clamp means with a front face for holding the cutting knife against said vertical contact surface in secure engagement, said clamp means having a shoulder along the lower portion of said front face for engaging the bottom of said cutting knife, first means for adjusting the height of said clamp means relative to said horizontal contact surface of said holding bar, second means for selectively moving said clamp means toward and away from said vertical contact surface;

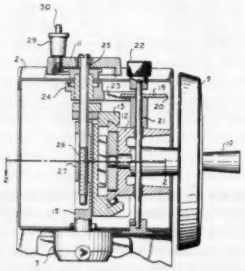
a resilient member positioned generally beneath the cutting knife between adjacent surfaces of said block and said holding bar for reducing shock to the cutting knife during a cutting operation.

3,926,085

SPECIMEN FEED FOR A MICROTOME

Norman W. Shatzel, deceased, late of Williamsville, N.Y. (by Mary P. Shatzel, administratrix), assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 2, 1974, Ser. No. 528,958
Int. Cl.[2] G01N *1/06*
U.S. Cl. 83—718 **2 Claims**



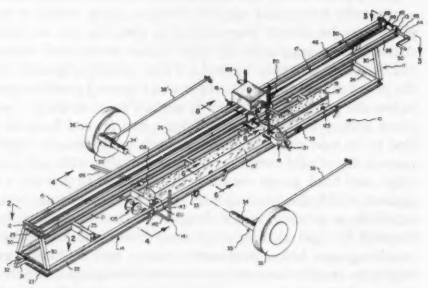
1. A microtome having a base, a support extending from said base, a carriage slideably mounted on said support, a manually operable drive means to move said carriage in a reciprocating path along said support, a manually positionable actuator on said support positionable along an axis parallel to the reciprocating path, a slideable specimen holder arm extending from said carriage in a direction generally perpendicular to the reciprocating path, means for holding a specimen in the distal end of said arm, a knife adjustably mounted on said base and positioned to cut said specimen as said carriage travels along said reciprocating path in one direction, an incremental feed means connecting said arm and said carriage, said feed means including a shaft mounted on said carriage, one end of said shaft being threaded, means mounted in said arm to engage the threads on said shaft, a clutch mounted on the other end of said shaft, said clutch being adapted to rotate said shaft in a single direction to advance the specimen toward said knife, a finger mounted to and extending from said clutch, said finger being adapted to engage said actuator as said carriage travels along said reciprocating path in the other direction to rotate said clutch and shaft through a small arc thereby providing an incremental feed of said specimen toward the knife between cuts.

3,926,086

PORTABLE SAW MILL

Paul R. Crane, Tucker Hill, Houghton, N.Y. 14744

Filed Nov. 1, 1974, Ser. No. 519,826
Int. Cl.[2] B27B *17/02;* **B23D** *57/02*
U.S. Cl. 83—801 **13 Claims**



1. A saw mill adapted to make a longitudinal cut in a log, comprising:

an elongated frame having a front end and a rear end, said frame including a horizontal lower section adapted to support a log to be sawed and including a horizontal upper section spaced above said lower section;

a carriage arranged on said upper section for movement therealong in either longitudinal direction;

carriage movement means engaging said carriage and said front and rear frame ends and operable to move said carriage along said upper section in either of said longitudinal directions;

a chain saw positioned between said upper and lower sections and supported by said carriage for movement therewith and operable to make a longitudinal cut in a log supported by said lower section; and

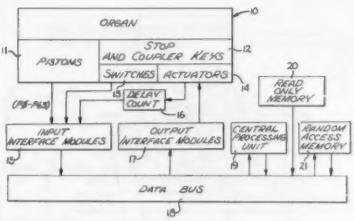
adjustment means operatively arranged between said chain saw and carriage for adjusting the vertical position of said chain saw relative to said carriage, said adjustment means including a pair of transversely-spaced vertically-movable racks having their lower ends connected to said chain saw, a transverse shaft rotatably mounted on said carriage, and a pair of transversely-spaced pinions mounted fast to said shaft and positioned to engage said racks,

whereby by rotating said shaft said racks may be moved to adjust the vertical position of said chain saw relative to said carriage.

3,926,087
COMPUTERIZED ORGAN REGISTRATION AFFECTING SYSTEM

Steven W. Griffis, 4753 Irvine Ave., N. Hollywood, Calif. 91602

Filed Oct. 4, 1974, Ser. No. 511,996
Int. Cl.² G10B 3/10
U.S. Cl. 84—345 **7 Claims**



1. An organ registration affecting system for use with electronic and pipe organs having a plurality of pistons and a plurality of stop and coupler keys and a plurality of actuators for setting and resetting the stops and couplers, said system comprising:

a. input interface means for translating and presenting signals responsive to a selected piston, the state of stop and coupler keys and engagement time of the organ actuators;

b. output interface means for setting and resetting the states of selected stop and coupler keys and actuators;

c. a central processing unit including a program counter, address register and arithmetic and logic unit and input and output means for transferring data to and from said central processing unit respectively, said input means being coupled to said input interface means and said output means being coupled to said output interface means;

d. read-only memory means for program storage, said central processing unit input means being coupled to said read-only memory means;

e. random-access memory means for storing data correlating the signal responsive to a selected piston and the selected actuator, the input and output means of said control processing unit being coupled to said random access memory means; and

f. at least two pages of working registers, each page comprising eight registers of two bytes each, said working registers being coupled to said arithmetic and logic unit of said central processing unit whereby a selected organ piston causes said central processing unit to correlate said piston with signals responsive to selected stop and coupler actuators, said signals responsive to said actuators being output to the organ by said output interface means.

3,926,088
APPARATUS FOR PROCESSING MUSIC AS DATA

Stephen A. Davis, Wappingers Falls; Keith H. Dougherty, Peekskill; Alan D. Levit; Thomas A. Hendrickson, both of Poughkeepsie, and Kenneth R. Sanderson, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

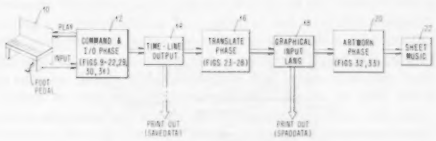
Filed Jan. 2, 1974, Ser. No. 430,458
Int. Cl.² G10G 3/04
U.S. Cl. 84—462 **5 Claims**

1. In combination with a data processing system:

a keyboard musical instrument connected to said data processing system;

means for scanning the key contacts of the individual keys of the keyboard for converting electrical signals produced by depressing said keys into data which is compatible with said data processing system,

means connected to said scanning means and responsive to signals from said data processing system for tranferring said data to said data processing system to thereby collect data representative of the music performed; and

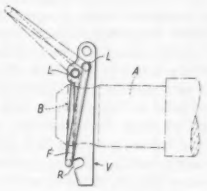


means in said data processing system for translating said data into a format suitable for outputting said data in musical notation.

3,926,089
SAFETY PIN

Herbert Ruebig, and Helmut Ruebig, both of Wels, Austria, assignors to Franz Rubig & Sohne KG, Wels, Austria

Filed Oct. 16, 1973, Ser. No. 406,962
Claims priority, application Austria, Oct. 31, 1972, 9240/72
Int. Cl.² F16B 21/18
U.S. Cl. 85—5 CP **2 Claims**



1. A safety pin assembly for axles and rotating shafts which comprises

a pin member having opposite ends;

a loop shaped snap-in spring member of a circular diameter having opposite ends which are pivoted to said pin member adjacent to each other near one end thereof, and an intermediate portion which is pivotally movable about said ends of said spring member into and out of engagement with one side of said pin member near the opposite end thereof,

said pin member being formed on one side near said opposite end thereof with a u-shaped recess with an actuate bottom which is adapted to fully receive and releasably hold said intermediate portion of said spring member under initial stress;

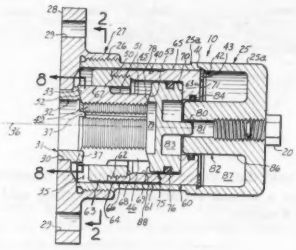
said recess shaped as an inclined notch with an upper and a lower arm, which extend from the surface of said pin member inwardly forming at the inner end of said notch said recess and a safety catch nose in the outer end of one of said arms inclined toward the outer end of the other said arm;

whereby the catch-end of said loop, when in ingagement with said notch is embedded therein and thus protected against disengagement by accidental extraneous impacts against it.

3,926,090
SEPARATION NUT

James W. Bunker, Saugus, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed Mar. 23, 1973, Ser. No. 344,158
Int. Cl.[2] F16B *37/10*
U.S. Cl. 85—33 4 Claims

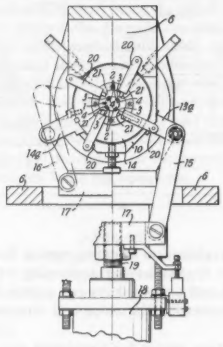


1. A separation nut for releasably engaging a threaded element, comprising: a housing having an internal cavity, an aperture to receive an element to be engaged by the nut, and a gas port communicating with the cavity; a seat member fixed to the housing and extending around said aperture, said seat member facing into the cavity and tapering inwardly as it extends into the cavity; anti-rotation means fixed relative to the housing; a plurality of nut segments, each having a concave surface bearing a fragment of the same thread facing in an inward direction and engaged by the anti-rotation means, a lock surface and a relief surface, both facing in an outward direction, and a pair of abutment surfaces, one at each end of the segments, the segments being grouped around a central axis with one of their abutment surfaces bearing against the seat member; an axially-extending lock cylinder in said cavity; a lock piston slidably fitted in said lock cylinder, said lock piston including a lock surface so proportioned and arranged as to embrace and hold the segments in said grouped condition when it overlaps their lock surfaces, an engagement shoulder, and a head having a driving face and a deceleration face, and an axially-extending buffer cylinder in said lock piston; a buffer piston slidably fitted in said buffer cylinder in fluid-sealing contact therewith, a power chamber being formed in said buffer cylinder between the buffer piston and said driving face, an abutment face on the opposite side of the buffer piston from the power chamber so disposed and arranged as to bear against the other of said abutment surfaces of the nut segments; a shoulder on said buffer piston facing and radially overlapping the engagement shoulder of the lock piston, whereby said shoulders can engage one another, the gas entry port communicating with the power chamber, and restraint means for holding the lock piston against the buffer piston and thereby holding the buffer piston against the nut segments, with the lock surface of the lock piston overlapping the lock surfaces of the nut segments, the restraint means releasing the lock piston for axial motion after the exertion of sufficient fluid pressure on the lock piston, whereby upon the exertion of said sufficient fluid pressure, the lock piston is axially shifted so that its lock surface overlaps the relief surfaces of the nut segments and not their lock surfaces, the buffer piston presses against the segments to move them radially outward, and the shoulder on the lock piston engages the shoulder on the buffer piston with an accompanying dissipation of kinetic energy, a deceleration chamber being formed in the cavity between the housing and the deceleration face, displacement of the lock piston being resisted in the deceleration chamber; a neck on said housing entering the deceleration chamber and passing through the head of the lock piston; and seal means extending between said neck and the head of the lock piston, which seal means is exposed to the power chamber.

3,926,091
MANUFACTURE OF TOOTHED WORKPIECES

Clifford Sloane, Neath, England, assignor to Cam Gears Limited, Hitchin, England

Filed June 13, 1974, Ser. No. 479,123
Claims priority, application United Kingdom, June 14, 1973, 28366/73
Int. Cl.[2] B23F *19/10*
U.S. Cl. 90—1.4 20 Claims



1. A method of removing surplus metal from the axial end faces of a plurality of teeth on a workpiece, said method comprising the steps of radially inwardly displacing a cutting means having a cutting edge for each tooth while simultaneously imparting circumferential rotation between the cutting means and the workpiece so that the cutting edges remove surplus metal from the end faces of their respectively associated teeth, and limiting said relative circumferential rotation so that each cutting edge is restricted to removing surplus metal from the end face of its associated tooth.

6. Apparatus for removing surplus metal from the end faces of a plurality of teeth on a workpiece, said apparatus comprising cutting means having a plurality of spaced apart cutting edges disposed in a generally circular array, means for locating the workpiece within the circular array of cutting edges, means for moving said cutting edges radially inwardly toward the workpiece and for simultaneously imparting relative circumferential rotation between said cutting edges and the workpiece so that said cutting edges remove surplus metal from the end faces of teeth with which they are respectively associated, and means for limiting said relative circumferential rotation between said cutting edges and the end faces of the teeth to restrict the removal of metal by each cutting edge to an associated one of the teeth.

3,926,092
CONCENTRIC HYDRAULIC BRAKE BOOST MECHANISM WITH SYSTEM BY-PASS ON PISTON O.D.

Robert E. Meyers, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed June 13, 1973, Ser. No. 369,625
Int. Cl.[2] F15B *9/10, 13/04*
U.S. Cl. 91—378 8 Claims

1. In a hydraulic boost mechanism for a vehicle hydraulic system including a fluid pressure source:

a housing defining a bore therewithin having an inlet adapted to be connected to said source and an outlet;

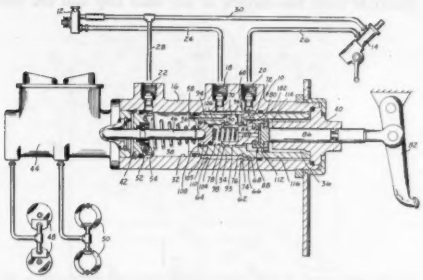
a piston slidably mounted in said bore and cooperating with one end of the latter to define a boost chamber therebetween;

fluid pressure control means carried by said piston and by the wall of the bore for regulating the fluid pressure level at said inlet between a lower value when said piston is disposed in a first position and a higher value when the

piston is shifted toward a second position, said fluid pressure control means including means for maintaining a continuous flow to the outlet independently of the position of the pistons said fluid pressure control means being defined by radially spaced annular surface means on said piston and said bore, respectively;

means defining a vent for said boost chamber;

control valve means slidably and coaxially arranged in said piston and shiftable from a first condition communicating



said boost chamber to the means defining said vent and to a second condition closing communication through the means defining the vent and initiating communication between the inlet and the boost chamber as the control valve means is shifted from the first condition; and

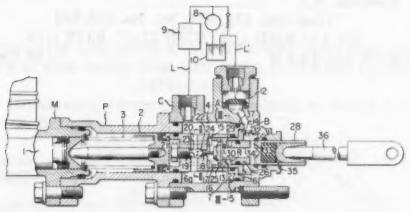
first resilient means acting on the control valve means to urge the latter to said first condition and second resilient means acting on said piston urging the latter to said first position.

3,926,093

OIL-HYDRAULIC SERVO-MOTOR

Tadao Nakagawa, Ueda, Japan, assignor to Nisshin Kogyo Kabushiki Kaisha, Japan

Filed June 6, 1974, Ser. No. 477,064
Claims priority, application Japan, Apr. 24, 1974, 49-46177
Int. Cl.² F15B *13/10*
U.S. Cl. 91—391 R **3 Claims**



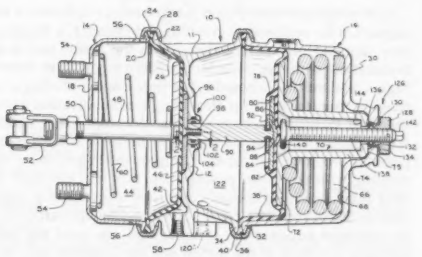
1. An oil-hydraulic servo-motor comprising: a power cylinder having a bore and an output piston slidably fitted in said bore, a control casing secured to said power cylinder at the rear end thereof and defining a cylindrical bore in axial alignment with said power cylinder, a servo piston slidably fitted in said cylindrical bore and defining, when fully retracted, a high and a low oil pressure chamber in said cylindrical bore, respectively, in the front and rear portions thereof, a piston rod extending axially and forwardly from said servo piston and held in sliding engagement with the rear end portion of said power cylinder in end-to-end relation with said output piston, an oil pressure supply source connected to said high oil pressure chamber, an oil reservoir communicating with said low oil pressure chamber, a reaction oil pressure chamber defined in said servo piston and communicating with the bore in said power cylinder, an input piston slidably supported in said control casing in axial alignment with said servo piston and having the piston face thereof extending forwardly into said reaction oil pressure chamber, and control valve means operable in response to limited forward and rearward movement of said input piston to place the bore in said power cylinder in and out of fluid communication with said high and low oil pressure chambers, said cylindrical bore of the control casing having a larger diameter front portion and a smaller diameter rear portion, said servo piston being slidable in said smaller diameter rear portion and including at the front end thereof an annular flange slidably fitted in said larger diameter front portion of said cylindrical bore, seal means on said servo piston engaging said smaller diameter rear portion, said annular flange having a number of circumferentially spaced radial notches therein operable to place said high and low oil pressure chambers in fluid communication with each other across the periphery of said servo piston when said servo piston assumes a definite axial position during advancing movement thereof in which said seal means is disengaged from said smaller diameter rear portion and enters said larger diameter front portion.

3,926,094

AIR OPERATED SPRING BRAKE

Sham L. Kurichh, Owosso, and Leon R. Acre, Ovid, both of Mich., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed July 2, 1973, Ser. No. 375,622
Int. Cl.² F01B *7/16*
U.S. Cl. 92—63 **8 Claims**



1. A spring operated brake actuator in combination with an air operated service brake actuator having a diaphragm movable in the presence of air pressure to actuate brakes on a vehicle, said spring operated actuator having a housing, an auxiliary diaphragm in said housing dividing the latter into a spring chamber and a fluid pressure chamber, a spring in said spring chamber acting on said auxiliary diaphragm to move the latter generally longitudinally of said housing in a brake applying direction upon a decrease in pressure in said fluid pressure chamber, said auxiliary diaphragm being movable generally longitudinally in the other direction to compress said spring in the presence of pressure in said fluid pressure chamber to allow operation of said service brake actuator independently of said spring operated actuator, a push plate in said fluid pressure chamber connected to said auxiliary diaphragm for movement with the latter, a push member extending generally longitudinally in said housing and having an end portion projecting through a wall of the latter, means connecting the other end of said push member to said plate for longitudinal movement of said push member with said plate and for universal angular displacement of said push member relative to said plate during longitudinal movement, a bearing slidably supported on said push member, and mounting means for supporting said bearing relative to said wall for universal angular displacement of said push member relative to said wall during longitudinal movement of said push member, said one end of said push member engaging the diaphragm of said service

brake actuator to operate the latter in the absence of pressure in said fluid pressure chamber.

3,926,095

PISTON PUMP

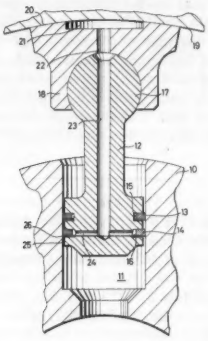
Dieter Weigle, Urach, Germany, assignor to Firma Wepuko-Hydraulik GmbH, Metzingen, Germany

Filed May 13, 1974, Ser. No. 469,455

Claims priority, application Germany, May 18, 1973, 2325242

Int. Cl.² F01B *31/10*

U.S. Cl. 92—157 **1 Claim**



1. In a high-pressure piston pump having a cylinder, a piston supported for reciprocation within the cylinder, a decompression chamber, means associated with the piston and in communication with the cylinder for defining a fluid throttling region, and means disposed in the piston and including a radial passage therethrough for providing communication between the fluid throttling region and the decompression chamber, the improvement wherein the outer peripheral surface of the piston is provided with an annular groove aligned and communicating with the radial passage, and wherein the fluid throttling region defining means comprises a piston ring disposed loosely in the annular groove and extending outwardly thereof to a position adjacent the cylinder wall, the axial gap defined between one face of the piston and the adjacent side wall of the annular groove defining a self-wiping fluid throttling region that communicates with the radial gap between the outer peripheral surface of the adjacent forward portion of the piston and the surrounding cylinder wall.

3,926,096

METHOD OF ASSEMBLING CARTON BLANKS

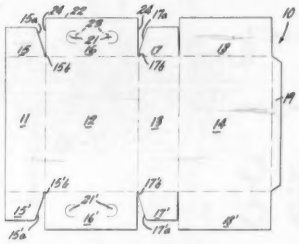
William J. Cupo, 216 York St., Jersey City, N.J. 07302

Division of Ser. No. 297,921, Oct. 16, 1972, Pat. No. 3,871,571. This application Sept. 12, 1974, Ser. No. 505,220

Int. Cl.² B31B *49/02*

U.S. Cl. 93—49 M **3 Claims**

1. A method of assembling a carton having four serially connected rectangular panels and four flaps at one end of the carton with each flap being hinged to a panel along the length of the panel end, a first of said flaps being joined to the first of said panels, the second of said flaps being joined to a second of said panels spaced from said first flap by third and fourth flaps which are joined to third and fourth panels, respectively, said first and second flaps being bent inwardly perpendicular to their respective panels to form inner flaps for the carton end, said third flap lying generally over both the first and second flaps perpendicular to its respective panel and glued to said first and second flaps, and said fourth flap overlying at least a portion of said third flap to form an outer flap for the carton end perpendicular to its respective panel and being glued to said third flap, said first and second flaps having a side lying adjacent the hinge line of the third flap and third panel which tapers generally upwardly and inwardly from said third flap when the first, second and third flaps are in a position which is substantially coplanar with their respective panels and tab means cut in the surface of the third flap which underlie and hold a portion of said first and second flaps, said tab means being joined to said third panel by hinge lines which lie in a direction traverse to the hinge line of said third flap, comprising applying glue to inner portions of said third and fourth flaps, pushing said tabs in said third flap so that they protrude from the surface of the third flap and are thereby



adapted to engage and underlie a portion of the first and second flaps, positioning the first, second and third flaps so that they are inwardly inclined to the mouth of the carton and the tab means in said third flap is in position to engage the underside of a portion of the first and second flaps, rotating the first, second and third flaps inwardly until all three flaps lie substantially perpendicular to their respective panels and the tab means in the third flap is under a portion of the first and second flaps and the third flap is thereby glued to portions of the first and second flaps, and rotating the fourth flap inwardly until it also is perpendicular to its respective panel and is glued to portions of said third flap.

3,926,097

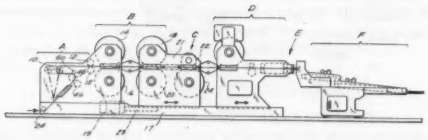
ROTARY DIE MECHANISM WITH VARIABLE SHEET VELOCITY MEANS FOR FORMING DIFFERENT SIZED BLANKS

Richard C. Santa Maria, Edison, and Frank J. Anastasio, Paramus, both of N.J., assignors to Bobst Champlain, Inc., Roseland, N.J.

Filed Aug. 13, 1974, Ser. No. 496,934

Int. Cl.² B26D *1/56;* B23D *25/12;* B31B *1/16*

U.S. Cl. 93—58.2 R **26 Claims**

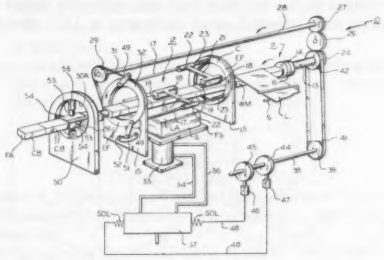


1. Apparatus for performing operations on a continuous sheet material comprising a first pair and a second pair of die carrying cylinders, the cylinders in said pairs respectively being spaced to form a first and a second nip respectively therebetween, each of the cylinders in said cylinder pairs being rotatable such that each of said pairs periodically performs an operation along a substantial length of the material during respective operative intervals, means for varying the velocity of the sheet material as it passes between said first nip, said means having a cyclical operation divided into first and second portions wherein the material is caused to move at a constant velocity during said first portion and at a nonconstant velocity during said second portion, said first portion occurring during the operative interval of said first cylinder pair.

3,926,098
WINDING CONVOLUTE CAN BODIES

Curtis J. Smith, Fenton, Mo., assignor to Container Corporation of America, Chicago, Ill.

Filed Aug. 12, 1974, Ser. No. 496,759
Int. Cl.² B31C *1/00*
U.S. Cl. 93—81 R **8 Claims**



1. In a machine for convolutely winding a container body other than one of purely cylindrical cross section from laminar plies;

a. a winding mandrel for receiving an end of a lamina and convolutely winding said lamina thereon;

b. means for advancing said wound lamina along said mandrel to a position for application of pressure against said wound lamina and for applying a second lamina to said wound lamina;

c. means for applying pressure to said wound lamina while the same is disposed on said mandrel throughout rotation thereof comprising;

i a frame rotating along an axis coincident with the axis of rotation of said winding mandrel;

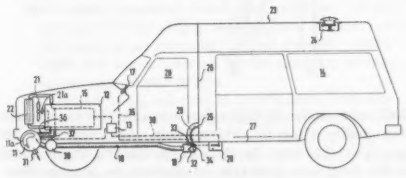
ii means for rotating said frame in the same direction as said winding mandrel but at a speed lower than the speed of said winding mandrel;

iii pressure applying mechanism mounted on said frame including members in contact with said second lamina throughout complete rotation of said container body and the lamina thereof.

3,926,099
METHOD OF AND DEVICE FOR DISINFECTING THE AIR EXTRACTED FROM THE ISOLATED INTERIOR OF AN AMBULANCE

Karl Grunenwald, Lorch, Germany, assignor to Binz & Co., Lorch, Germany

Filed July 24, 1974, Ser. No. 491,246
Claims priority, application Germany, July 30, 1973, 2338601
Int. Cl.² B60H *1/00*
U.S. Cl. 98—2.05 **9 Claims**

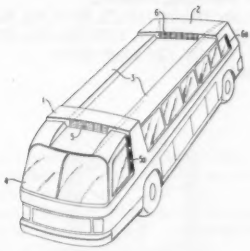


1. An ambulance comprising: an engine, a coolant circuit associated with said engine, a hot water heater unit, means for extracting air from the sealed interior of said ambulance and for feeding said extracted air for use in the combustion of a fuel to said heater unit, said hot water heater unit being connected to said coolant circuit, automatic cut-out means connected to said heater unit for rendering the same selectively effective and ineffective, said cut-out means responding to the temperature of the coolant in said coolant circuit, a manually operable switch connected to said automatic cout-out means for rendering the same ineffective, an air induction line leading from said air extracting means to said heater unit, and a change-over valve for selectively admitting outside air and air from said ambulance interior to said induction line.

3,926,100
BUS

Robert Bermanseder, and Norbert Bermanseder, both of Sindelfingen, Germany, assignors to Daimler-Benz AG, Germany

Division of Ser. No. 114,420, Feb. 11, 1971, Pat. No. 3,797,881. This application Jan. 2, 1974, Ser. No. 429,817
Claims priority, application Germany, Feb. 12, 1970, 2006250
Int. Cl.² B62D *31/04*; B60H *1/26*
U.S. Cl. 98—2.14 **13 Claims**



1. A bus body arrangement comprising:

lower frame means operatively connected to respective front and rear axles,

a forward roll-over girder means constructed as a hollow bearer means extending upwardly from said lower frame means,

a rearward roll-over girder means constructed as a hollow bearer means extending upwardly from said lower frame means,

each of said roll-over girder means being supported on said lower frame means,

a first longitudinal bearer means constructed as a hollow bearer means extending longitudinally along one lateral side of a roof area of the bus body, and

a second longitudinal bearer means constructed as a hollow bearer means extending along the lateral side of said roof area opposite said one lateral side,

each of said first and second longitudinal bearer means being connected with said forward and rearward roll-over girder means, wherein the longitudinal bearer means include means for the guideance of air for the interior ventilation of the bus body.

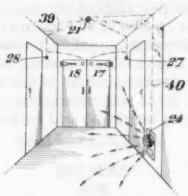
3,926,101
FIRE SAFETY SYSTEMS

Cyril H. Moss, Heath Common, Storrington, Sussex, England

Filed June 27, 1974, Ser. No. 483,818
Claims priority, application United Kingdom, June 26, 1973, 30345/73
Int. Cl.² A62C *37/18*
U.S. Cl. 98—33 R **10 Claims**

1. A fire safety system for use in a building having a plurality of accommodation units and a plurality of communal units providing means of access to said accommodation units, said system including a plurality of smoke detectors in said com-

munal units and means controlled by said smoke detectors and responsive to detection of smoke in one of said communal



units to admit air under pressure to that communal unit and to restrict passage of smoke from that communal unit to another communal unit or other communal units.

3,926,102

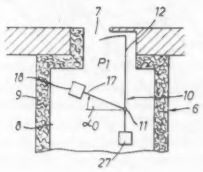
AIR INJECTING APPARATUS FOR AIR CONDITIONERS OR THE LIKE

Guido Amandus De Lepeleire, Heverlee, Belgium, assignor to Danfoss A/S, Nordborg, Denmark

Division of Ser. No. 356,498, May 2, 1973, Pat. No. 3,865,021. This application Oct. 7, 1974, Ser. No. 512,543

Int. Cl.² F24F *13/10*

U.S. Cl. 98—102 **4 Claims**



1. An air conditioning system air inlet assembly comprising an air flow duct, a damper forming a variable outlet orifice for said duct, said damper being mounted for pivotal movement relative to a horizontally extending axis, said damper being movable in an opening direction by pressurized upstream air in said duct, mechanical means biasing said damper in a closing direction, said mechanical means having an angular relationship with said damper to vary the size of said orifice in accordance with the pressure of said pressurized air to maintain a constant air velocity at said orifice, said duct extending vertically, said damper constituting a first lever arm relative to said axis, said mechanical means including a second lever arm extending in a generally horizontal direction.

3,926,103

RECOVERY SYSTEM FOR SPRAYING APPARATUS

Everett C. Smith, Slippery Rock, Pa., assignor to American Glass Research, Inc., Butler, Pa.

Filed Dec. 6, 1973, Ser. No. 422,416

Int. Cl.² F23J *11/00*; **B05C** *15/00, 11/10*

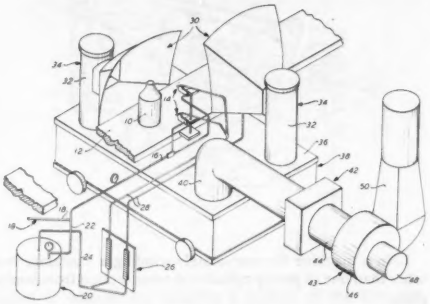
U.S. Cl. 98—115 SB **9 Claims**

1. A material recovery system for a glass bottle spraying apparatus wherein the solution sprayed is a liquid containing a tin compound, comprising:

a. spray channeling means for gathering the solution not deposited on said bottles;

b. collecting means, including a removable tray connected cooperatively with said channeling means; said channeling means including at least one exhaust hood and intake duct, said exhaust hood having generally a curved design, whereby sharp corners and recesses are eliminated or minimized to avoid, otherwise, the collection of said sprayed solution in said corners and recesses, said exhaust hood connected to the sidewall of said intake duct, said intake duct straightly extending therefrom downward into the top of said collecting means;

c. means for creating a flow of said sprayed, undeposited solution into said channeling means and through said recovery system; said flow creating means including at least one exhaust duct connected to said collecting means, said intake duct and exhaust duct physically arranged at the interface with said collecting means such that said collected spray undergoes a 180° change of



direction in passing from said intake duct to said exhaust duct; and

d. means for deflecting substantially all of said flow entering said collecting means via said intake duct, downward towards the bottom of said tray and into physical contact therewith said flow of sprayed, undeposited solution entering said collecting means out of said intake duct, substantially parallel to the plane of said deflecting means in a substantially vertical, downward direction, whereby there is insubstantial contact with said deflecting means.

3,926,104

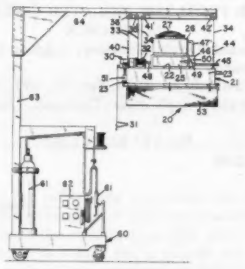
INDUSTRIAL SAFETY APPARATUS FOR DISPOSING OF WELDING FUMES

James H. El Dorado, Minneapolis, Minn., assignor to Midwest Mechanical Services, Inc., Minneapolis, Minn.

Filed June 24, 1974, Ser. No. 482,201

Int. Cl.² F23J *11/00*

U.S. Cl. 98—115 VM **1 Claim**



1. Self-contained industrial safety apparatus for use to maintain the quality of air in welding shop while conserving the energy required to heat the shop and protecting the air ambient to the shop from pollution, comprising, in combination:

a rigid hood having a closed top with an outlet and surrounding edges depending therefrom;

movable means including a wheeled vehicle for positioning said hood over a work piece to be welded;

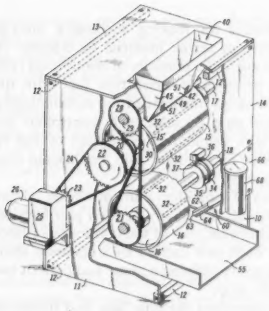
connecting means including a winch carried by said hood and pulleys carried by said vehicle for actuation to vary

the height of said hood to accomodate work pieces of different heights;
a flexible skirt of flame resistant material depending from the lower edges of said hood to define a working volume of shop space beneath which welding operations releasing atmospheric pollutents may be performed;
illumination means carried by said hood within said hood for providing working illumination within said volume to replace normal illumination cut off by said hood;
an electrostatic air cleaner mounted in said outlet in the top of said hood;
and means mounted on said air cleaner for drawing shop air from said working volume through said air cleaner and thereafter returning said air to the shop.

3,926,105
COOKING APPARATUS

Walter B. Warning, Sr., Chicago, Ill., assignor to Automation Development & Engineering Corporation, Elk Grove Village, Ill.

Continuation of Ser. No. 137,492, April 26, 1971, abandoned. This application Nov. 23, 1973, Ser. No. 418,403
Int. Cl.² A21B *1/48*
U.S. Cl. 99—423 **5 Claims**

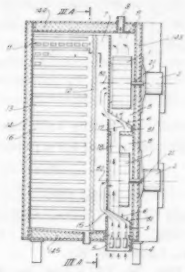


1. Apparatus for cooking pancakes, comprising
a housing,
a pair of drums each having an external cylindrical cooking surface thereon,
means rotatably mounting said drums in mutually parallel spaced apart relationship one above the other within said housing,
means disposed within said drums for heating said cooking surfaces to a pancake cooking temperature,
motor means for rotating said drums in opposite directions at the same circumferential speed,
feed means mounted above the upper one of said drums having a fill opening accessible from outside said housing for feeding an uncooked liquid pancake batter directly onto the upper portion of the cooking surface of said upper one of said drums,
said speed being selected in combination with the cooking temperature of said drums such that said batter is cooked on one side on the upper drum and then falls by gravity onto the lower drum with the other side in contact with the lower drum to cause said other side to be cooked, and means disposed below the lower one of said drums for receiving the completely cooked pancakes as they fall by gravity from said lower one of said drums,
whereby said batter is cooked from one side on the upper drum and then falls by gravity onto the lower drum where the batter is cooked from the other side.

3,926,106
FOOD-TREATMENT APPARATUS WITH CIRCULATED HOT COMBUSTION GAS

Erich Deusing, Herbornseelbach; Helmut Bernhardt, Weidenhausen, and Wilfried Durth, Burbach-Wahlbach, all of Germany, assignors to Burger Eisenwerke Aktiengesellschaft, Herborn, Germany

Filed June 11, 1973, Ser. No. 368,692
Claims priority, application Germany, June 15, 1972, 7222344
Int. Cl.² A47J *37/06;* **F24C** *15/32*
U.S. Cl. 99—447 **5 Claims**



1. A food-treatment apparatus comprising:
a food-treatment chamber adapted to receive a foodstuff and having a rear wall;
a circulating chamber behind said wall adjacent said food-treatment chamber and communicating therewith through an inlet formed in said wall;
circulating means in said circulating chamber for displacing hot combustion gas along a circulation path through said chambers past said foodstuff;
a burner chamber behind said wall and directly beneath said circulating chamber;
a gas burner in said gas-burner chamber directly beneath said circulating chamber, said wall being formed with an opening communicating between said food-treatment chamber and said burner chamber at an upper portion of the latter for introducing hot combustion gas from said gas burner into said food-treatment chamber and for feeding hot combustion gas along said circulation path; and
a common heat-conductive partition between said gas-burner chamber and said circulating chamber, said partition being inclined upwardly towards said opening.

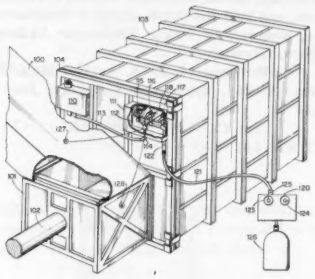
3,926,107
APPARATUS FOR APPLYING DEODORIZING CHEMICALS TO COMPACTED REFUSE

Peter Dunlap, Box 117, Amherst, N.H. 03031, and Daniel W. Sullivan, 29 Mechanic St., Fitchburg, Mass. 01420

Filed Aug. 7, 1973, Ser. No. 386,397
Int. Cl.² B30B *15/16*
U.S. Cl. 100—45 **5 Claims**

1. A refuse disposal system consisting of:
a. a compactor-type solid waste disposal and storage unit which comprises a sealed container with one side adapted to receive a compaction chamber and ram which may optionally be connected to a chute feed; and,
b. in combination therewith, a refuse odor control system comprising: a source of liquid chemical-deodorizer suitable for inhibiting odor, bacteria, and insects in solid waste matter; connector and valve-micronizing means together with a source of compressed gas for dispensing said chemical, said valve means being mounted adjacent

to an opening in the storage unit so as to direct the chemical-deodorizer into said unit; and a dual timer mechanism



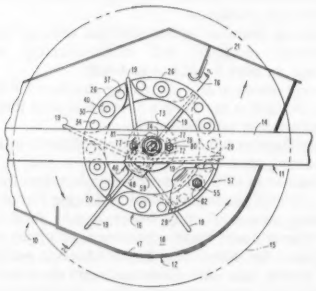
for automatically activating said valve means at a predetermined frequency and for a predetermined duration.

3,926,108

DEBRIS COLLECTING APPARATUS

Charles W. Doering, Clarksville, Ind., assignor to Brinly-Hardy Co., Inc., Louisville, Ky.

Filed Nov. 26, 1973, Ser. No. 418,898
Int. Cl.[2] B30B *5/00;* E01H *1/04*
U.S. Cl. 100—177 18 Claims



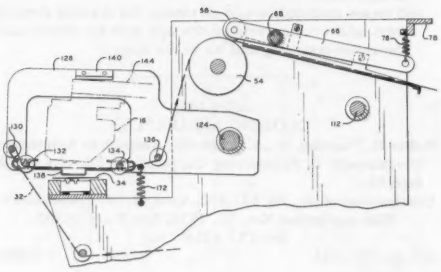
13. A debris collecting apparatus including:
a frame having wheels to support said frame;
a housing supported by said frame;
compression means disposed within said housing to compress debris received within said housing;
and said compression means including:
a hollow cylindrical compression drum having a plurality of openings;
a blade disposed within each of said openings;
means supporting said blades and said drum to cause rotation of said drum and said blades and to move each of said blades during each cycle of rotation so that each of said blades is retracted inwardly within the periphery of said drum through said opening and extended outwardly beyond the peripphery of said drum through said opening;
each end of said supporting means being supported by said frame;
and means cooperating with each end of said supporting means and said frame to control the angular position of said supporting means relative to said frame to determine the positions of maximum extension and retraction of each of said blades.

3,926,109

PRINTING RIBBON ADVANCING MEANS

John F. Filsinger, and Roger P. Mueller, both of Syracuse, N.Y., assignors to Texmark, Incorporated, Syracuse, N.Y.

Division of Ser. No. 272,922, Sept. 13, 1972. This application Mar. 22, 1974, Ser. No. 453,847
Int. Cl. B41j *35/34*
U.S. Cl. 101—90 4 Claims

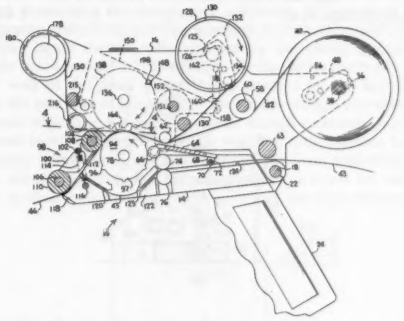


1. In apparatus for making successive inscriptions on a continuous strip of textile material by transfer of a printing medium from each of a plurality of continuous ribbons coated therewith by pressure of raised type face with ribbons while contacting the strip, mechanism for automatically advancing the ribbon and strip by selectively controlled increments in conjunction with sequential movement of the type face to make successive inscriptions, said mechanism comprising:
a. powered drive means;
b. a plurality of individual pairs of ribbon advancing rollers arranged with the rollers of each pair frictionally engaging therebetween one of the continuous ribbons, and one roller of each pair carried by a common shaft;
c. a base support defining a plane and path of movement for the textile strip;
d. means supporting the type face and ribbons for reciprocating movement between a first position, wherein each of the ribbons contact the strip and the type face contacts the ribbons, and a second position, wherein the ribbons are spaced from the strip and the type face is spaced from the ribbons;
e. a pair of strip advancing rollers between which the strip is frictionally engaged;
f. first cam means rotatable by said drive means to move the type face and ribbons between said first and second positions;
g. second cam means rotatable by said drive means to effect intermittent rotation of said common shaft, thereby rotating said one ribbon advancing roller of each pair and advancing each of the ribbons;
h. third cam means rotatable by said drive means to effect intermittent rotation of one of said strip advancing rollers, thereby moving said strip along its path of movement;
i. motion transfer means for transmitting movement from said drive means through each of said cam means to effect simultaneous advance of the ribbons and strip upon each movement of the type face and ribbons to said second position;
j. first adjustment means for selectively controlling the distance of travel of the ribbons at each intermittent advance thereof; and
k. second adjustment means for selectively controlling the distance of travel of the strip at each intermittent advance thereof.

3,926,110
HAND HELD TICKET PRINTER APPLICATOR

David W. Hubbard, Stamford, and Lloyd G. Kittredge, Trumbull, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 11, 1974, Ser. No. 460,210
Int. Cl.² B41L 47/46
U.S. Cl. 101—92 8 Claims



1. A hand held ticket printer applicator for the printing of bar codes, the combination comprising:

a. a frame member having a lower portion and an upper portion pivotably mounted to one another;

b. means for releasably holding said upper portion to said lower portion;

c. a printing drum supported by said upper portion having at least one line of bar code font and at least one line of alpha-numerics on the perimeter thereof;

d. a label strip extending intermediate said frame member portions adjacent said printing drum;

e. a printing medium supported within said upper portion and extending intermediate to said drum and said label strip;

f. means associated with said frame member for moving said printing medium through said frame member;

g. means supported by said frame member for placing said printing drum and said label strip into printing engagement with one another when said printing drum is in an original position where said one line of bar code is adjacent to said printing medium;

h. means for holding said printing drum stationary and moving said label strip relative to said printing drum when said label strip and said printing drum are in printing engagement;

i. means for releasing said printing drum holding means;

j. means for partially rotating in a first direction said printing drum in unison with the movement of said label strip when engaged with one another to bring said line of alpha-numerics into printing engagement with said label strip;

k. means for disengaging said printing drum and said label strip; and

l. means for partially rotating said printing drum opposite to said first direction to return said printing drum to said original position.

3,926,111
PRINTING MACHINE

Walter Bohm, A-6322 Kirchbichl 226, Austria

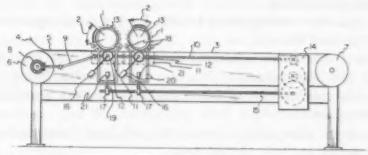
Continuation-in-part of Ser. No. 293,171, Sept. 28, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,467
Int. Cl.² B41L 13/08
U.S. Cl. 101—116 11 Claims

1. A printing machine for repeatedly printing relatively long overall patterns on a web of material, said machine comprising:

support means for continuously moving said web of material at a predetermined speed;

at least two printing units mounted on the side of said web of material opposite said support means, each of said printing units including a rotatably mounted cylindrical screen, each of said screens having on the periphery thereof a printing sector with leading and trailing edges in the direction of rotation for printing a separate portion of said overall pattern and a non-printing sector;

means operatively connected to each of said printing units to lower the screens thereof from a raised position into a lowered position in a predetermined sequence with the leading edge of each said printing sector in contact with said web of material for printing on said web of material the respective portions of said overall pattern when the respective printing sectors of said screens are rotatively aligned with said web of material, and for raising said screens out of contact with said web of material into said



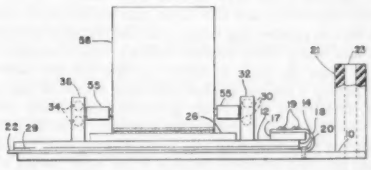
raised position after the trailing edge of each said printing sector has contacted said web of material;

first drive means operatively connected to each of said screens for continuously imparting a first rotary movement of said screens while said screens are in both said raised and lowered positions, said first rotary movement causing a circumferential rotation of each of said screens at a speed equal to said speed of said web of material; and second drive means operatively connected to each of said screens for imparting a second rotary movement thereto, simultaneous to the application of said first rotary movement, each time said screens are in said raised position, and only when said screens are in said raised position, said second rotary movement being predetermined in accordance with system parameters including the size of said printing and non-printing sectors of said screens, the net of said first and second rotary movements when said screens are in said raised position being such that the leading edges of the printing sectors are in position to be engaged by said web when said screens are lowered by said means for raising and lowering.

3,926,112
SIMPLIFIED SILK SCREEN PRINTING DEVICE

Mary Neman, 2531 Vera Ave., Cincinnati, Ohio 45237

Filed Aug. 6, 1973, Ser. No. 385,737
Int. Cl. B41f 15/02; B41n 1/24; B41f 15/42
U.S. Cl. 101—123 14 Claims



1. Printing apparatus comprising:

a base plate upon which a blank sheet is placed for receiving an imprint;

a frame having at least one substantially straight edge and having an opening;

a hinge comprising an elongated relatively thin elastic sheet secured along said edge of the frame and to said base plate whereby said frame is pivotally secured to said base for movement between a printing position in which said frame lies flat on said base and a ready position pivoted away from said base;

a screen received in said opening, said screen means having porous portions defining a predetermined imprint pattern through which ink can be forced to said blank sheet on said base plate when said frame is in said printing position, thereby causing said blank sheet to receive said imprint; and

means for forcing ink through said screen means.

12. An inking device for use with a screen printing apparatus having a porous sheet through which ink is forced in a predetermined imprint pattern onto a blank sheet, when said inking device is swept across said porous sheet, said inking device comprising:

an operator-manipulated handle having an elongated slot in one end thereof;

a base removably attached to said handle, said base having a tab complementary to said slot, said tab being releasably retained in said slot, said base having a curved surface; and

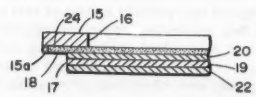
a porous elongated ink-retaining element mounted on the curved surface of said base,

the ink in said porous element being forced through said porous sheet as said base and porous element are swept across said porous sheet.

3,926,113
THIN FRAME STENCIL ASSEMBLY

Donald J. Steidinger, Barrington, Ill., assignor to Wallace Business Forms, Inc., Hillside, Ill.

Filed Mar. 21, 1974, Ser. No. 453,641
Int. Cl.² B41N *1/24*
U.S. Cl. 101—128.1 **4 Claims**

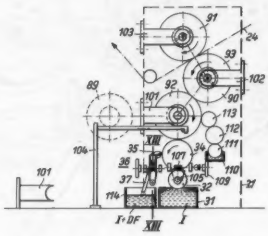


1. A business form comprising at least one ply having space thereon for receipt of a stencil assembly, a unitary stencil assembly releasably adhered to said ply over said space and completely removable therefrom, said assembly including two layers adhesively secured together, the first of said layers being a flexible stencil layer immediately adjacent said ply and in contact therewith, the second of said layers being a relatively fiexible frame layer spaced from said ply in the major portion thereof by said first layer, said second layer having a back face in confronting relation to said ply, said second layer back face being totally covered with a pressure sensitive adhesive to cause the same to adhere to said one ply, said frame layer having a cut-out portion affording access to said stencil layer, said frame layer being generally peripherally coextensive with said stencil but having a portion extending beyond the stencil periphery with said portion being directly adhered to said ply, said relatively flexible frame layer having a thickness of the order of said ply to thereby pass unobtrusively around the platen of a typewriter.

3,926,114
ROTARY LITHOGRAPHIC PRINTING PRESS WITH INK AND DAMPENING FLUID SEPARATOR

Walter E. S. Matuschke, Kaiser-Wilhelm-Strasse 6, 36 Hamburg, Germany

Continuation-in-part of Ser. No. 739,843, June 25, 1968, abandoned. This application Aug. 21, 1970, Ser. No. 65,932
Claims priority, application Germany, June 30, 1967, 1561056; Oct. 24, 1967, 1611272
Int. Cl.² B41F *7/26, 7/32, 31/04, 31/08*
U.S. Cl. 101—142 **1 Claim**



1. A rotary lithographic offset printing device for printing a moving web, comprising, in combination, a frame, a printing form cylinder rotatably mounted upon said frame, said printing form cylinder having a smooth, uninterrupted peripheral cylindrical surface, thin offset printing form means carried directly by said printing form cylinder surface, a transfer cylinder rotatably mounted upon said frame adjacent said printing form cylinder and parallel thereto and having a closed cylindrical peripheral rubber surface engaging said printing form means, said web engaging said transfer cylinder periphery, a pressure cylinder rotatably mounted upon said frame adjacent said transfer cylinder and parallel thereto and engaging said web in opposed relation with respect to engagement of said web and transfer cylinder, a dampening roller rotatably mounted upon said frame for dampening said printing form means with a dampening fluid, an inking roller rotatably mounted upon said frame engaging said printing form means, an ink fountain, ink supply means for supplying an ink film of uniform thickness to said inking roller, scraping-off means engaging said inking roller and removing the ink not taken from said inking roller by the printing form means and the dampening liquid transferred from said printing form cylinder to said inking roller, an ink and dampening fluid separator communicating with said scraping-off means, and separated ink transfer means interconnecting said ink supply means and said separator, said ink supply means including an ink layer thickness adjusting member defining a border extending parallel to the axis of said inking roller, said border being adjustably displaceable as a whole parallel to itself.

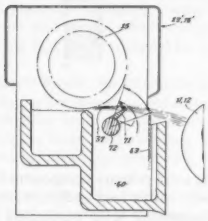
3,926,115
SPRAY DAMPENING APPARATUS

Arthur Graham Alsop, Bristol, England, assignor to Strachan & Henshaw Limited, Bristol, England

Filed Jan. 25, 1974, Ser. No. 436,829
Claims priority, application United Kingdom, Feb. 1, 1973, 5148/73The portion of the term of this patent subsequent to Sept. 18, 1990, has been disclaimed.
Int. Cl.² B41F *7/30, 7/32*
U.S. Cl. 101—148 **6 Claims**

1. In a dampening apparatus for a printing machine, the dampening apparatus having a supply trough, the trough having upstanding walls, one of said walls having a horizontal upper edge lower than upper edges of other walls thereby providing a weir edge, means for feeding liquid in the trough so that the liquid can be maintained at a given level in the trough higher than the level of the weir edge and spill continu-

ously over the weir edge, a tangentially rigid rotor with an axis of rotation parallel to the weir edge and approximately vertically above it, thin projections on the rotor and axially spaced from one another along said axis of rotation, the said projections extending radially from and being spaced from the weir edge and extending to above the level of the weir edge and below the level of the liquid in the trough, means for rotating said rotor for causing the projections to cut into the thickness of the liquid over the weir edge to emerge where it spills from the weir edge to project directionally a spray of liquid and means positioning the dampening apparatus and a roll of a dampening train of the printing machine such that the said roll receives liquid directionally sprayed by the rotor, a drain trough below a path of the spray projected from the weir, a front wall of the drain trough being parallel to and spaced from the said one of the walls of the supply trough providing the weir edge, and a base of the drain trough extending from the said front wall to the said one wall, an output orifice for the spray being above an upper edge of the front wall of the drain trough, lips defining the outlet orifice, a cover for said rotor, said cover having a vertical front wall, the improvement



consisting of a quick-response means for adjustment of spray output from the dampening apparatus to the dampening train comprising means in the dampening apparatus actuable for preventing at least partially egress of spray from the apparatus and control elements for actuating the said actuable means, the said actuable means actuable between a condition in which the spray passes out through the orifice and a condition in which it is at least partially caught, wherein the said actuable means is a shutter, means positioning the shutter above the base of the drain trough whereby it is movable in planar movement into and out of the spray path to catch liquid of the spray, so that the said liquid when caught can fall to the base of the drain trough, said shutter being between the front wall of the cover and the rotor, said shutter having a planar portion extending parallel to the axis of rotation of the rotor, said positioning means being located on the cover, obliquely extending slots in the planar portion of the shutter engaged by the positioning means whereby the planar movements of the shutter have a vertical component into and out of the path of the spray and a lateral component parallel to the axis of the rotor, and a drive element for the shutter arranged to drive the shutter in directions generally parallel to the axis of the rotor.

3,926,116
DAMPENING APPARATUS FOR OFFSET PRINTING PRESS

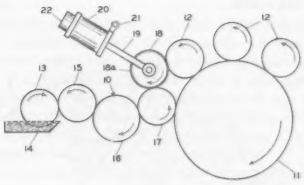
Fredric C. Wildeman, Madison, Wis., assignor to Webcrafters, Inc., Madison, Wis., a part interest

Filed July 1, 1974, Ser. No. 484,704
Int. Cl.² B41F *7/26, 31/30*
U.S. Cl. 101—148 **8 Claims**

1. An improved offset printing press of the type having a plate cylinder, an ink supply system including at least one ink form roller which is adapted to deposit ink on said plate cylinder by making rolling contact therewith, and a dampening system including a form dampener roller disposed adjacent to one ink form roller and which is adapted to deposit dampening liquid on the plate cylinder by making rolling contact therewith, wherein the improvement comprises:

a. a revolvable separator roller interposed between said form dampener roller and said one adjacent ink form roller;

b. said separator roller having a surface consisting of a material that has an affinity for ink; and



c. means for maintaining said separator roller in contact with said one ink form roller whereby said surface of said separator roller is wetted with ink, for advancing said separator roller into rolling contact with said form dampener roller when said press is printing and said form dampener roller surface has a film of dampening liquid thereon, and for retracting said separator roller from contact with said form dampener roller when said press is not printing.

3,926,117
COLOR PRINTING METHOD

Donald Dunn Milligan, North Balwyn, Australia, assignor to Triprint Pty. Ltd., North Balwyn, Australia

Filed Apr. 11, 1974, Ser. No. 460,056
Claims priority, application Australia, Apr. 13, 1973, 2981/73
Int. Cl.² B41C *1/12*; **B41M** *1/14*
U.S. Cl. 101—211 **7 Claims**

1. An improved method of preparing half-tone combination primary color and black printing plates and using said plates in a half-tone primary color printing process including black line work where the black color is approximated by balancing the primary color components of the print and where the printing process involves using three primary color printing passes only, in a manner known generally per se, comprising, as the improvement, the steps of:

a. preparing separated, differentially angled screen images having normal dot densities of the primary color and black components of the combination plates in a manner known generally per se;

b. reducing the dot sizes of the normal dot density screen images corresponding to the respective red, blue and yellow components of the combination plates prior to the combining of each image with its respective black component, while leaving the dot sizes of the normal dot density black component of the prepared screen images unreduced;

c. preparing combination primary color and black half-tone printing plates in a manner generally known per se using the prepared screened primary color images having reduced dot sizes as the primary color component image of each combination plate;

d. printing the final color image using said plates and primary color inks; and

e. maintaining the density and volume of said inks during said printing process within a range suitable to maintain optimum color density in the final half-tone image despite the reduction of dot sizes of the primary color components of each printing plate, whereby dense black line work is obtained and the appearance of the half-tone color work is enhanced.

3,926,118
ROTARY PRINTING PRESS IMPRESSION CYLINDER HAVING CLAMPING AND SHEET GRIPPING DEVICES

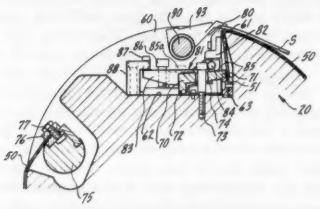
Friedrich Preuss, Sprendlingen, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher, Germany

Filed Aug. 15, 1974, Ser. No. 497,723

Claims priority, application Germany, Aug. 16, 1973, 2341326

Int. Cl.² B41F *21/04, 29/04, 7/10*

U.S. Cl. 101—246 **1 Claim**



1. In an impression cylinder for a lithograph printing press, the combination comprising a body having a gap in the form of a longitudinally extending groove having a well-defined longitudinal edge and a recess extending continuously thereunder, a covering layer having a rigid mounting bar at one end, clamping means for clamping the mounting bar in the recess, means recessed in the cylinder for tensioning the opposite end of the covering layer so that the layer is drawn into a tight bend over the edge of the groove and thence over the surface of the cylinder, a gripper pad bar extending continuously along the edge of the groove, spaced mounts seated in the groove for mounting the gripper pad bar and for releasably holding it in a normal position in which it is snugly adjacent the bend in the covering layer, each mount being of "L" shape having a radial portion supportively engaging the gripper pad bar and having a projecting arm portion at right angles thereto with a pivot at the bend of the "L", a gripper shaft in the groove having a set of grippers cooperating with the gripper pad bar, means including a cam follower on the shaft for engaging a relatively fixed cam surface adjacent the cylinder for cyclical operation of the grippers for engaging the leading edges of successive sheets, means for disengaging the gripper shaft from the cam follower so that the grippers may be retracted well away from the gripper pad bar, the projecting arm portion having a limit stop to define the normal position and having screw means for retracting the gripper pad bar from its normal position to a position separated from the bend of the covering layer to provide a clear radial path so that upon loosening of the clamping means the mounting bar and covering layer may be removed from the recess clear of the cylinder for replacement by an alternate mounting bar and covering layer.

3,926,119
EXPLOSIVE DEVICE

Gerald L. Hurst, and Oldrich Machacek, both of Dallas, Tex., assignors to Tyler Holding Company, Dallas, Tex.

Filed Jan. 28, 1974, Ser. No. 436,591

Int. Cl.² F42B *3/00*

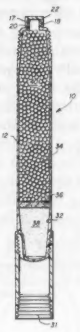
U.S. Cl. 102—24 R **53 Claims**

1. An explosive device which includes a particulate primary solid component and a particulate secondary solid component, which solid components are both actuated by a liquid component, comprising:

a. a container forming an enclosure and at least one sealable opening for adding said liquid component therein;

b. a bed comprising sensitized particulate material selected from oxidizing and non-oxidizing material having a particle size smaller than about 3000 microns and positioned within said enclosure forming said particulate primary solid component;

c. porous retaining means which will pass the said liquid component but not said primary or secondary solid components, said porous retaining means separating said



particulate solid primary component from the remainder of the cavity within said enclosure; and

d. a bed comprising solid particulate oxidizing material forming said particulate secondary solid component and positioned within the said remainder of said cavity.

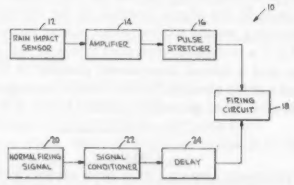
3,926,120
RAIN IMPACT SENSING PROXIMITY FUZE

David Williams, Bethesda, and George K. Lucey, Jr., Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 30, 1970, Ser. No. 90,211

Int. Cl.² F42C *13/00, 11/02*

U.S. Cl. 102—70.2 P **7 Claims**



1. A rain impact sensing proximity fuze, comprising:

a. a firing circuit that initiates the detonation of said fuze;

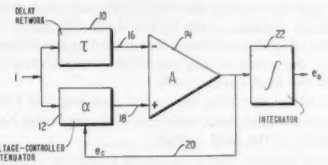
b. proximity sensing means for delivering a firing signal to said firing circuit; and

c. rain impact sensing means for momentarily desensitizing said firing circuit against unwanted firing signals generated by said proximity sensing means upon the impact of a raindrop with said fuze.

3,926,121
TIME REMAINING UNTIL ENCOUNTER COMPUTER FOR A FUZE SYSTEM

Robert H. McCracken, Chevy Chase, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 7, 1974, Ser. No. 467,769
Int. Cl.² F42C *13/04*; **G01S** *9/00*
U.S. Cl. 102—70.2 P **3 Claims**



1. Electronic apparatus mounted on a moving projectile for determining the time remaining until said projectile encounters a target, said projectile including means for receiving a signal reflected from said target, which comprises:

means for delaying said received signal for a predetermined time interval;

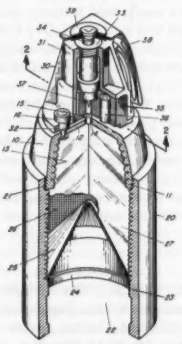
variable attenuator means for attenuating said received signal according to the magnitude of a control signal; and differential amplifier means having as its two inputs the respective outputs from said delaying means and said variable attenuator means for producing as its output said control signal;

whereby said control signal is indicative of the time remaining until said projectile encounters said target.

3,926,122
GRENADE WITH FUZE (U)

William G. Wolterman, Huntington Beach, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 282,081, Aug. 11, 1972. This application Apr. 22, 1974, Ser. No. 463,939
Int. Cl.² F42C *15/22*
U.S. Cl. 102—79 **1 Claim**



1. A fuze for safing and arming an artillery deliverable, submissile grenade used against personnel and armored targets which comprises:

a housing having an axially aligned cylindrical arming screw bore which communicates with a transversely positioned rectangular slider bore, said rectangular slider bore having its longitudinal axis perpendicular to said arming screw bore axis;

a stab detonator;

an internally threaded arming screw retainer axially positioned within said cylindrical bore;

a cylindrical arming screw operatively retained within said cylindrical housing bore by said retainer, said arming screw having a firing pin on one end and a firing pin threaded section on the other end;

ribbon means for unscrewing said cylindical arming screw fixedly attached to said threaded end of said arming screw;

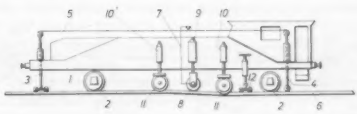
an eccentrically weighted detonator slider slidably held by said housing and said arming screw so that said stab detonator contained therein is held in an out-of-line position when said arming screw is in a safe position, and centrifugally moved by the spin forces of said grenade to an in-line armed position when said arming screw is withdrawn therefrom by the differential forces of spin on said grenade and said unscrewing means; and

detent means for locking said slider into said in-line armed position so that said slider cannot return to said out-of-line position when said grenade is expelled from said artillery over said target.

3,926,123
TRACK SURFACING APPARATUS

Franz Plasser, deceased, late of Vienna, Austria; by Erna Plasser, heir; Josef Theurer, both of Johannesgasse 3, Vienna, Austria (A-1010); Egon Schubert, Lainzerstr. 24b/8, and Klaus Riessberger, Panigigasse 24, both of Vienna, Austria

Filed Oct. 9, 1973, Ser. No. 404,427
Claims priority, application Austria, Oct. 13, 1972, 8816/72
Int. Cl.² E01B *37/00*
U.S. Cl. 104—7 R **29 Claims**



1. An apparatus for surfacing a track consisting of rails fastened to ties resting on ballast, comprising means for determining any deviation of the track position from a desired level, means for imparting a substantially horizontal vibration to the track including a vibration-producing means and means for transmitting the vibration produced by said means to the track, and means arranged in association with the vibration imparting means for imparting a substantially vertical downward ballast compacting pressure on both rails of the track whereby the ballast under the track ties may be compacted simultaneously with positioning the track at the desired level.

3,926,124
RAILROAD CAR RETARDERS

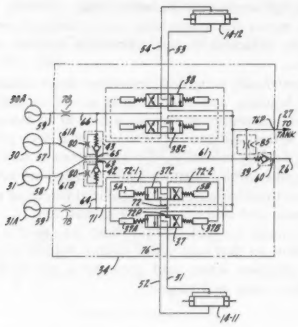
Earl E. Frank, Tallman, N.Y., assignor to Abex Corporation, New York, N.Y.

Filed July 25, 1974, Ser. No. 491,830
Int. Cl.² B61K *7/08*
U.S. Cl. 104—26 A **16 Claims**

1. In a hydraulically operated railroad car retarder system in which retarders on adjacent tracks are actuated by respective hydraulic cylinders, hydraulic apparatus for actuating the respective retarder cylinders independently or concurrently and comprising:

a pair of accumulator subsystems each of which includes at least one large accumulator of predetermined capacity and a small accumulator of less capacity paired therewith for conjointly delivering fluid pressure to the respective retarder cylinders;

directional valve means interposed between each of the accumulator subsystems and each of the retarder cylinders to control delivery of fluid under pressure from the accumulator subsystems respectively to the retarder cylinders;



and means to restrict delivery of fluid from each of the smaller accumulators to a rate substantially less than the rate of delivery from the larger accumulator.

3,926,125

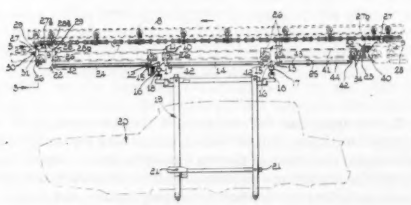
POWER AND FREE CONVEYOR

Olaf John Barclay Orwin, Birmingham, England, assignor to Redman Fisher Engineering Limited, England

Filed Feb. 20, 1974, Ser. No. 444,174

Int. Cl.² B61B *3/00*

U.S. Cl. 104—94 **7 Claims**



1. In a conveyor system comprising:

a. an endless power-driven conveyor element having a plurality of driving dogs spaced from one another lengthwise of the element,

b. a load-supporting track extending parallel to the path of travel of the conveyor element,

c. a plurality of load carriers which run on the track, each load carrier comprising a trolley having a body mounted on wheels which run on said track,

d. a first drive control element at the front end of each load carrier,

e. a second drive control element at the rear end of each load carrier for co-operation with the first drive control element of a following carrier when such following carrier comes into proximity with a preceding carrier,

f. a supporting body supporting one of said drive control elements, spaced lengthwise of the track from the load carrier and mounted on wheels which run on the track,

g. a connecting element articulately connecting said supporting body with said body of the load carrier,

h. drive transmitting means associated with each load carrier for releasably engaging with a driving dog of the conveyor element to transmit drive from the conveyor element to the load carrier, said drive transmitting means being releasable from engagement with a driving dog of the conveyor element by co-operation of the first drive control element of the associated load carrier with the second drive control element of a preceding load carrier, the improvement wherein:

i. said supporting body is spaced lengthwise of the track from the drive transmission means of the load carrier,

j. said connecting element is contractable to permit relative movement of said supporting body and said body of the load carrier in a direction lengthwise of the track,

k. said connecting element comprises two members relatively slidable in the fore and aft direction,

l. one of said members is articulated to the supporting body,

m. the other of said members is articulated to said body of the load carrier, and

n. resilient damping means for damping said relative movement is interposed between said supporting body and said body of the load carrier,

o. said resilient damping means comprises a helically coiled spring whereof opposite end portions are connected with respective ones of said members, whereby when a following load carrier carrying a load comes into proximity with a preceding, stationary, load carrier, a substantial part of the momentum of the load is absorbed by said damping means.

3,926,126

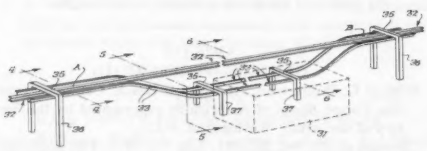
VEHICLE DIVERTING APPARATUS

Karl Heinz Voss, 6781 Ward Road, Wheatfield, N.Y. 14304

Filed Feb. 12, 1975, Ser. No. 549,364

Int. Cl.² E01B *25/26*

U.S. Cl. 104—130 **17 Claims**



1. In a vehicle adapted to be selectively diverted from a primary track comprising a pair of rail surfaces to a secondary track comprising a pair of spaced rails located on opposite sides of said primary track, said primary track being provided with first cam means and said secondary track being provided with second cam means; a first set of wheels engageable with said secondary track rails; a second set of wheels engageable with said primary track in one position and movable axially, when said secondary track is engaged by said first set of wheels, to a second position out of engagement with said primary track; first reciprocating means adapted to be moved by said first cam means to disengage said second set of wheels from said primary track; and second reciprocating means adapted to be moved by said second cam means to engage said second set of wheels with said primary track.

3,926,127

RAILWAY AXLE FRICTION SNUBBER ASSEMBLY

Seisuke Shima, Yamatokoriyama, Japan, assignor to Sumitomo Metal Industries Limited, Osaka, Japan

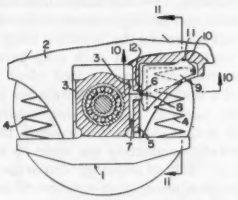
Filed Dec. 19, 1973, Ser. No. 425,949

Int. Cl.² B60G *15/04;* **B61F** *5/30, 5/38, 5/52*

U.S. Cl. 105—224 R **11 Claims**

1. An axle spring snubbing device for railway cars comprising a friction surface provided on each upper side surface of a wing type axle box, an axle spring interposed between said axle box and a truck frame, a cap means mounted on the upper end of the axle spring between said upper end and said truck frame, an axle spring guide provided in the truck frame, mutually directly engaging means on said cap means and axle

spring guide, respectively, for moving said cap means laterally toward a friction surface of said axle box when the axle spring



is compressed and a laterally movable friction shoe means provided between said cap and said axle box friction surface.

3,926,128

RAILWAY CAR SHUNTING LOCOMOTIVE

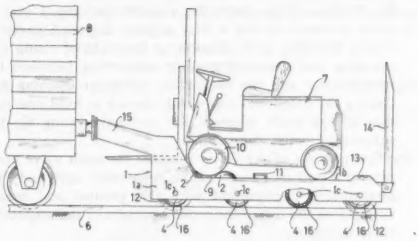
Werner Zappel, Muehlstrasse 13-15, D-6921, Grombach, Germany

Filed Sept. 24, 1973, Ser. No. 399,962

Claims priority, application Germany, Oct. 18, 1972, 2251093; Aug. 16, 1973, 2341491

Int. Cl.[2] B60B *17/02;* **B61C** *9/08, 13/00;* **B61F** *13/00*

U.S. Cl. 105—26 R **7 Claims**



1. A shunting device especially useful for shunting freight cars, having traction wheels along each longitudinal side thereof adapted to run along railway tracks, and having a platform to accommodate thereon a motor-driven driving vehicle such as a fork-lift truck having driving wheels, there being at least one pair of rotatably mounted driving rollers at the top of said platform arranged on substantially parallel axes and spaced apart from each other and having generally upwardly facing traction surfaces defining therebetween a space which is narrower than the diameter of the driving wheels of the driving vehicle, so that said driving wheels with their axes generally parallel to said driving rollers can rest thereon in driving relation, the improvement comprising:

at least three traction wheels arranged one behind the other on each longitudinal side of the device;

the treads of all of the traction wheels having a covering of resilient friction material;

motion-transmitting connection means coupling said traction wheels and said driving rollers, so that rotary driving of said rollers by said driving wheels will effect running rotation of said traction wheels;

the foremost and rearmost traction wheels on each side of the device having a flange; and

the traction wheels intermediate said foremost and rearmost traction wheels at each side of the device being flangeless so as to facilitate negotiating curves in railway tracks.

3,926,129

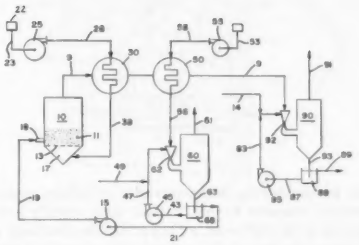
EVAPORATIVE CONCENTRATION OF WASTE SLUDGES WITH INCINERATOR EXHAUST GASES

Clarence J. Wall, Westport, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Jan. 3, 1975, Ser. No. 538,396

Int. Cl.[2] F23G *5/02*

U.S. Cl. 110—7 B **15 Claims**



1. A fluid bed incineration system for combustible waste streams having a high proportion of water therein wherein the waste feed liquor is subjected to evaporative concentration using the waste heat of said fluid bed incinerator comprising, a fluid bed reactor having a constriction plate for supporting a fluidized bed of particulate material thereabove and defining a windbox therebelow,

heat exchangers arranged to receive the exhaust gases of said fluid bed incinerator,

means for conducting the exhaust gas stream from said fluid bed reactor through said heat exchangers and thence to a venturi scrubber,

blower means for providing air in volume to said heat exchangers,

conduit means for conducting preheated air from a first of said heat exchangers to said windbox as the fluidizing air for said fluid bed incinerator,

an evaporator connected to said second of said heat exchangers by a conduit whereby a heated air flow is provided to said evaporator,

means for introducing a weak feed liquor into said evaporator for exposure to said heated air flow to drive off water from said weak liquor and thereby provide a concentrated feed liquor,

means for conducting said concentrated feed liquor from said evaporator to said fluid bed reactor for direct injection into the fluidized bed thereof.

10. A method for fluid bed incineration of combustible waste liquors in which weak feed liquors are subjected to evaporative concentration using waste heat from the exhaust gases of said fluid bed incinerator, comprising the steps of,

passing the exhaust gas of said fluid bed reactor through heat exchangers,

heating air by passing air in volume through said heat exchangers,

fluidizing the fluid bed in said reactor with said heated air, evaporating water from said weak feed liquor with said heated air to provide a strong feed liquor,

injecting said strong feed liquor into said fluid bed reactor for destruction by combustion.

3,926,130

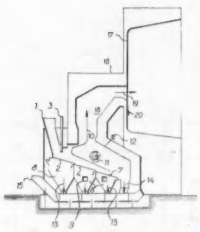
INCINERATION OF HOSPITAL REFUSE

Mojmir Stloukal; Zdenek Syrovatka; Milan Dolezel, and Karel Stripek, all of Brno, Czechoslovakia, assignors to Prvni Brnenska strojirna, Brno, Czechoslovakia

Filed Aug. 20, 1974, Ser. No. 499,087

Int. Cl.[2] F23G *5/00*; F22B *1/22*

U.S. Cl. 110—10 **3 Claims**



1. An incinerator for the incineration of refuse, comprising an auxiliary chamber having at least three serially arranged mechanical grate platforms, a hopper for the discharge of the refuse above the first of the grate platforms, each of the platforms comprising a plurality of spaced bars, means for reciprocating the bars of the first platform, means for reciprocally moving alternate bars of a second of the three platforms, the bars between the alternate bars of the second platform being fixed in position, a portion of the bars of the second platform being in vertical alignment with the bars of a third of the platforms, means for moving the bars of the third platform in phase opposition with the bars of the second platform, the bars of the third platform comprising a plurality of fixed bars and a plurality of movable bars, the fixed bars of the second platform being in partial vertical alignment with the movable bars of the third platform and the movable bars of the second platform being in partial vertical alignment with the fixed bars of the third platform, the incinerator further comprising a waste heat boiler, said grate platforms being separated from the waste heat boiler, said waste heat boiler being equipped with an independent ignition means, said auxiliary chamber being interconnected by an outlet draught to a combustion chamber of the waste heat boiler.

3,926,131

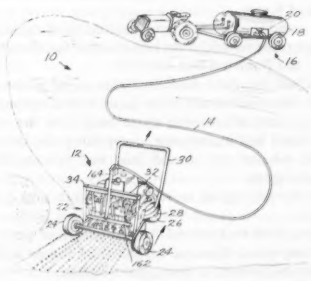
INJECTOR FOR SOIL TREATING LIQUIDS

William C. Collins, 5501 SW. 74 St., Miami, Fla. 33143

Filed Mar. 29, 1973, Ser. No. 346,023

Int. Cl.[2] A01C *23/02*

U.S. Cl. 111—6 **3 Claims**



1. An injector for soil treating liquids, comprising:

an applicator including a frame means for supporting the frame from the ground surface for permitting the frame to be drawn along the ground surface;

a plurality of injection tongs generally arranged in a transversally extending row, each injection tong being vertically disposed and having a downwardly directed tip;

indexing means mounting the injection tongs on the chassis for cyclic reciprocation of each tong between an upper extreme wherein the tip is raised clear of the ground surface and a lower extreme wherein the tip has plunged beneath the surface, the indexing means including: a crank shaft means, means for rotating the crank shaft; means pivotally connecting the tongs to the crank shaft means at a plurality of angularly disparate cranking positions for reciprocation upon rotation of the crank shaft; said tongs being grouped into a plurality of units, each unit including at least two of the tongs, the indexing means further including a body for each unit co-mounting the tongs thereof;

means defining a nozzle adjacent each tip, aimed for dispensing treating liquid into the soil when the tip lies beneath the surface;

means defining a passageway for liquid leading from the frame, through each tong to the nozzle means, said passageway including a manifold mounted on the frame, a high pressure hose connection upstream of the inlet to the manifold and a plurality of conduits leading from the manifold to the tongs;

said plurality of conduits proceeding through the respective number of branches of said conduits to individually serve each tong;

a valve for each unit, interposed in said passageway for normally selectively obstructing each conduit, each valve being disposed in the respective unit body upstream from the dividing of the respective conduit therein;

a valve actuator having a first portion disposed to sense where the tong is in relation to its cycle of rising and plunging and a second portion connecting between the first portion and the respective valve for opening and closing the respective valve only during at least one portion of the cycle wherein the respective tong tip lies submerged below the surface;

the first portion of the valve actuator for each valve comprising a rod mounted on the respective unit body for intermittent engagement with the ground and means connecting the rod to the second portion of the respective valve actuator;

a reservoir disposed free of the applicator;

high pressure flexible hose means communicating the reservoir with said passageway carried on the frame;

pump means communicated with the reservoir and high pressure hose means for supplying treating liquid under pressure pressure in the range of 150–600 p.s.i. to the applicator.

3,926,132

YARN FEED ROLLER ASSEMBLY

Edward C. Lear, Farleton, and Nigel S. Fitton, Great Harwood, both of England, assignors to The Singer Company, New York, N.Y.

Filed Oct. 17, 1974, Ser. No. 515,769

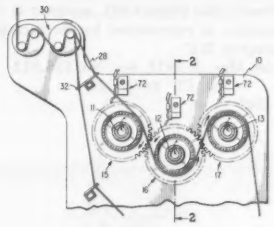
Claims priority, application United Kingdom, Aug. 17, 1974, 36310/74

Int. Cl. D05c *15/18*

U.S. Cl. 112—79 A **12 Claims**

1. A yarn feed roller assembly for a tufting machine including a plurality of hollow drive shafts, at least a feed roll on each of said shafts and rotatable relative thereto, the corresponding rolls of the said shafts being drivingly connected one to another, an electromagnetic clutch means between each roll and its respective shaft comprising a first element fixed for rotation with said shaft and a second element axially movable relative to said shaft, said feed roll being rotationally fixed to

said axially movable member, a slip ring for each roll, means on each shaft for mounting a slip ring corresponding to each roll on said shaft, electrical conducting means connected to said first element and extending through said shaft axially into operative electrical contact with a corresponding slip ring, electricity conducting brushes, brush supporting means held



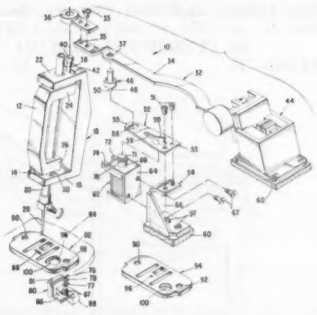
against rotation and positioned on said slip rings for retaining at least one brush in contact with each slip ring and for communicating electricity from a source selectively to the brushes, whereby the electromagnetic clutches may be actuated to drivingly couple the rolls to one or the other of the drive shafts.

3,926,133

SEWING MACHINE SAFETY DEVICE

William Herron, Elizabeth; Kenneth D. Adams, Madison, and John Petronchak, Singac, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed Nov. 1, 1974, Ser. No. 520,084
Int. Cl.² D05B *3/02*
U.S. Cl. 112—158 R **18 Claims**



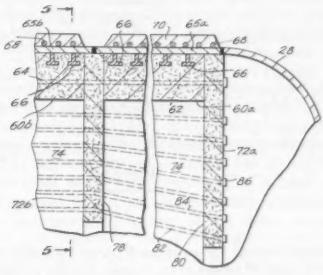
1. In a sewing machine having a needle bar supporting an endwise reciprocatory needle and jogging means cooperating with the needle to laterally jog the needle during the formation of zig-zag stitches, a work bed on the sewing machine, throat plate means accommodated on said work bed having selectable portions to support work against reciprocation of said needle to accommodate the formation of a zig-zag stitch pattern or a straight stitch pattern, and safety means for inhibiting operation of said jogging means, said safety means including switching means responsive to the presence on said work bed of said throat plate means when one of said selected portions is arranged adjacent to the reciprocatory path of said needle to accommodate the formation of one of said stitch patterns.

3,926,134

PRESTRESSED CONCRETE TANKS FOR LIQUID NATURAL GAS TANKERS

John J. Closner, Douglaston; Tadeusz Josef Marchaj, New York, and Sven Hjalmar Wichman, Yaphank, all of N.Y., assignors to Preload Technology, Inc., Garden City, N.Y.

Division of Ser. No. 292,727, Sept. 27, 1972, Pat. No. 3,863,408. This application Dec. 12, 1974, Ser. No. 532,016
Int. Cl.² B63B *25/12*
U.S. Cl. 114—74 R **3 Claims**



1. A marine transport system for cryogenic liquids, comprising the elements of:

a. an outer marine hull;

b. a cradle for a horizontally-oriented, cylindrical tank formed from prestressed concrete and having a circular cross-section; and

c. a horizontally-oriented, cylindrical tank of circular cross-section, adapted for containing cryogenic liquids positioned in said cradle, comprising the elements of:

1. a concrete, cylindrical tank wall having a plurality of steel prestressing tendons located therein in axial orientation;

2. a steel sheath anchored to the exterior surface of said wall;

3. a prestressing tendon wrapped essentially circumferentially about the exterior of said steel sheath;

4. at least two, annular stiffening disks positioned coaxially within the said wall said disks having holes therein for through-passage of axially oriented prestressing tendons;

5. a plurality of stiffening plates positioned radially-axially with respect to said tank and abutting at both axial extensions thereof, said stiffening disks and at their radial outermost extension, the said cylindrical tank wall, said stiffening plates having essentially axially oriented prestressing tendons therein;

6. steel heads defining the ends of said cylindrical tank and attached to said stiffening disks; and

7. inlet and outlet means for said cryogenic liquid.

3,926,135

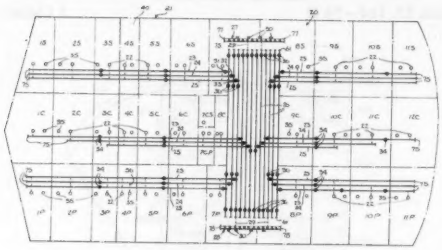
MULTIPURPOSE PIPELINE SYSTEM FOR HANDLING FLUIDS ON LIQUID CARGO VESSELS

Paul V. De Gregorio, Armonk, N.Y., assignor to Stolt-Nielsen, Inc., Greenwich, Conn.

Filed Dec. 18, 1974, Ser. No. 533,963
Int. Cl.² B63B *25/08*
U.S. Cl. 114—74 R **20 Claims**

1. A fluid storage tank and pipeline system comprising a plurality of storage tanks, a plurality of transfer pipelines extending adjacent to and between said plurality of tanks for conducting fluids to and from selected ones of the tanks, said plurality of transfer pipelines being fewer in number than said plurality of storage tanks, each of said storage tanks having means providing a pipe connection opening of the tank, each of said plurality of transfer pipelines having respectively opposite ends and further having means providing pipe connection

openings thereof respectively associated with, but spaced from each said storage tank pipe connection opening, means for closing selected ones of said transfer pipeline pipe connection openings, movable pipe connection means for connecting said pipe connection opening on any storage tank to a selected one of said transfer pipeline pipe connection openings associated with the tank, removable cap means on each of said respectively opposite ends of each said transfer pipeline, and

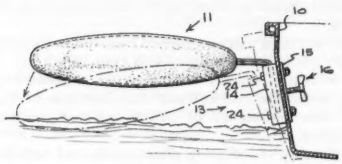


a plurality of shutoff valves in each of said transfer pipelines, one of said shutoff valves in each said transfer pipeline being adjacent to an end thereof which is common to such valved end of each other of said plurality of transfer pipelines, and the others of said shutoff valves being at respective locations between two of said pipe connection openings in the transfer pipeline with which the valve is associated.

3,926,136
REMOVABLE OUTRIGGER FLOAT AND MOUNTING DEVICE

Milton B. Shroyer, P.O. Box 338, Mineral Wells, Miss. 38648

Filed Aug. 27, 1974, Ser. No. 501,199
Int. Cl.² B63B *43/14*
U.S. Cl. 114—123 **3 Claims**

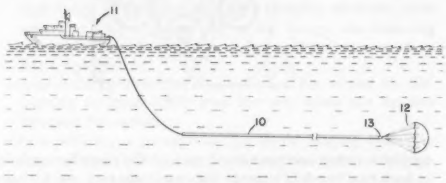


1. An outrigger float device for a boat comprising a float having two containment straps encircling the float and spaced from opposite ends of the float with the ends of each strap overlapped and fastened together with the opposite end of the same strap and bent downwardly and parallel to the side of the boat to form a downwardly projecting member and with a threaded bore extending hereinto, mounting blocks positioned on an outboard side of the boat in alignment with the downwardly projecting members and having upwardly opening slots to receive the downwardly projecting members and a safety bolt hole through an inboard side of each of the mounting blocks for alignment with the threaded bore on the downwardly projecting member when the downwardly projecting member is inserted in the mounting block slot and mounting bolt holes extending through each of the mounting blocks, stress distribution plates positioned on an inboard side of the boat and having mounting bolt apertures aligned with the mounting bolt holes in the mounting blocks and safety bolt apertures aligned with the safety bolt holes in the mounting blocks, mounting bolts passing through the mounting bolt apertures in the stress plates, the side of the boat and the mounting bolt holes in the mounting blocks to secure said mounting blocks to the side of the boat, and safety lock bolts having wing-nut type heads and self-locking threaded bolt portions whereby the safety lock bolts can be inserted through the safety bolt apertures in the stress plates, the side of the boat, and the safety bolt holes in the mounting blocks to engage the threaded bores in the downwardly projecting members.

3,926,137
DEEP OCEAN PARACHUTE RELEASE

Norman F. Johnson, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 3, 1975, Ser. No. 555,012
Int. Cl.² B63B *21/48*
U.S. Cl. 114—209 **6 Claims**

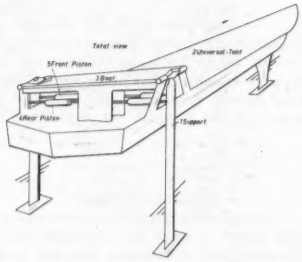


1. An apparatus for releasing a drogue chute from an elongate array extended in tension comprising:
a housing connected to the array;
means for frangibly coupling the housing to more than one riser of the drogue chute;
means for breaking the frangible coupling means being mounted adjacent thereto; and
means for sequentially initiating the breaking means to effect releasing of the drogue chute in stages thereby preventing the snapping of the elongate array.

3,926,138
DRIVE FOR HYDROFOIL BOAT

Horst Eichler, Auf den Sande 12, 5400 Koblenz, Germany

Filed Oct. 11, 1974, Ser. No. 514,168
Claims priority, application Germany, Oct. 11, 1973, 2351034
Int. Cl.² B63H *1/36*; B63B *1/28*
U.S. Cl. 115—29 **4 Claims**



1. A drive for a hydrofoil boat comprising:
at least one foil substantially horizontally parallel to the longitudinal axis of the boat disposed on each side of the boat;
a flat vertical support member disposed substantially perpendicular to the longitudinal axis of said foils and having one end connected to each foil and its other end pivotably connected to the boat; and
drive means mounted on the boat and connected to each support member so that during a lateral movement to the starboard, the associated supports are pointed in an angular pitch toward the starboard, and when the supports are

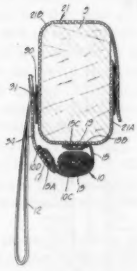
laterally moved toward the port side, the associated sections are pointed in an angular pitch toward the port side.

3,926,139

SELF STORING PROTEST FLAG USED IN BOAT RACES

Cullen M. Sabin, Solana Beach, Calif., assignor to Geoscience Ltd., Solana Beach, Calif.

Filed Feb. 25, 1975, Ser. No. 552,928
Int. Cl.[2] G09F *17/00*
U.S. Cl. 116—26 8 Claims



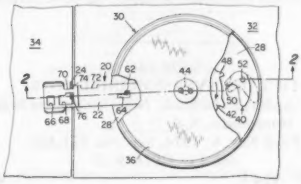
1. A flag or the like of clothlike material for attachment to a support, a cloth base strip having one edge thereof secured to one edge of said clothlike material, means including adhesive like material secured to said base strip for quickly attaching and detaching said base strip to said support, and quickly attachable and detachable means for releasably maintaining said clothlike material in a furled condition.

3,926,140

ACTUATING DEVICE FOR A CLOSURE ALARM MECHANISM

Joseph Bargiel, 5245 Ambridge Drive, Agoura, Calif. 91301

Continuation-in-part of Ser. No. 133,052, April 12, 1971, abandoned. This application Dec. 10, 1973, Ser. No. 423,388
Int. Cl.[2] G08B *13/08*
U.S. Cl. 116—85 10 Claims



1. An actuating device adapted to be mounted on a closure member having a stationary portion and a movable portion, for indicating the unauthorized opening of the movable portion of the closure member, the device comprising:

an alarm mechanism, having a deactivated position, and an activated position, providing the indication of the unauthorized opening of the movable portion of the closure member in the activated position;

a slider movably mounted on the closure member for selective movement to an unarmed position, a first position, a second position, a third position and a fourth position, the slider having a portion connectable to a portion of the alarm mechanism, the slider being connected to the alarm mechanism in the unarmed position, the first position, the second position and the third position of the slider and the slider being disconnected from the alarm mechanism in the fourth position of the slider, the alarm mechanism being positioned in the deactivated position when connected to the slider and the alarm mechanism being positioned in the activated position when disconnected from the slider in the fourth position of the slider;

bias means connected to the slider for biasingly moving the slider toward the fourth position of the slider; and

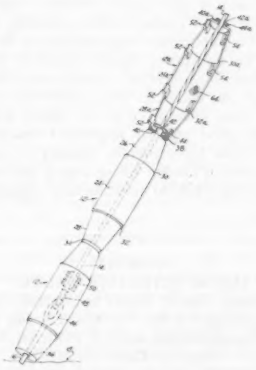
means removably engageable with portions of the slider for cooperatingly positioning the slider in the unarmed position, the first position, the second position and the third position, said means engaging one portion of the slider preventing movement of the slider via the bias means and positioning the slider in the unarmed position, said means being disengageable from the slider allowing the slider to be moved via the bias means from the unarmed position to the first position wherein said means engages another portion of the slider preventing movement of the slider via the bias means and positioning the slider in the first position, said means being disengageable from the slider via the opening of the movable portion of the closure member allowing the slider to be moved via the bias means from the first position to the second position wherein said means engages one other portion of the slider preventing movement of the slider via the bias means and positioning the slider in the second position, said means being disengageable from the slider via the closing of the movable portion of the closure member allowing the slider to be moved via the bias means from the second position to the third position wherein said means engages one other portion of the slider preventing movement of the slider via the bias means and positioning the slider in the third position, and said means being disengageable from the slider via the unauthorized opening of the movable portion of the closure member allowing the slider to be moved via the bias means from the third position to the fourth position disengaging the slider from the alarm mechanism and positioning the alarm mechanism in the activated position.

3,926,141

MODULAR WIRE GUARD

Philip W. Taylor, Howell, Mich., assignor to Taylor Industries, Inc., Howell, Mich.

Filed May 31, 1974, Ser. No. 475,153
Int. Cl.[2] E04H *12/20*; G01D *21/04*
U.S. Cl. 116—114 R 13 Claims



1. A modular guard assembly for protecting and enhancing the visibility of a length of wire, said assembly comprising a plurality of individual modular units disposed end to end about said length of wire, each of said units comprising:

a pair of mating half shell sections adapted to snap together and peripherally loosely enclose said wire;

means integral with said half shell sections for permanently interlockingly connecting said half shell sections in mated relationship, said means comprising:

a barbed prong on one half shell section, and

a corresponding lip on said mating half shell section for engaging said barbed prong; and

means at each end of said modular unit for nonrigidly interconnecting adjacent modular units for forming said assembly.

3,926,142

METER

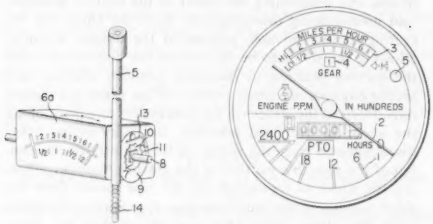
Keiji Okamoto, Fujieda, Japan, assignor to Yazaki Sogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1974, Ser. No. 512,218

Claims priority, application Japan, Dec. 14, 1973, 48-141747[U]

Int. Cl.² G01P *1/08*

U.S. Cl. 116—116 **3 Claims**



1. A meter for use in a multi-speed vehicle for indicating both the rotating speed of the engine and the running speed of the vehicle by a single pointer, comprising a meter body, a dial, a display window formed in said dial, a character drum of polygonal cross section incorporated within said meter body and provided on a plurality of side faces thereof with respective speed scales corresponding to the individual gear positions of said vehicle, means for causing rotation of said character drum so that the speed scale corresponding to the specific gear position at which said vehicle is operating can solely be exposed in said display window, said means for causing rotation of said character drum including a push knob at the exterior of said meter body adapted to be moved linearly, means for converting linear movement of said push knob into rotating movement of rotary elements thereby causing rotation of said character drum, said converting means including a ratchet wheel fixed to one end of said character drum, a ratchet pawl urged in response to the linear movement of said push knob thereby causing rotation of said ratchet wheel, and a ratchet spring urging said ratchet pawl toward said ratchet wheel to maintain firm engagement therebetween.

3,926,143

LIQUID DETECTING GAUGE

Harold A. Hothan, 1445 E. Dexter St., Covina, Calif. 91724

Continuation-in-part of Ser. No. 434,787, Jan. 21, 1974, abandoned. This application Aug. 16, 1974, Ser. No. 497,948

Int. Cl.² G01F *23/08*

U.S. Cl. 116—118 R **11 Claims**

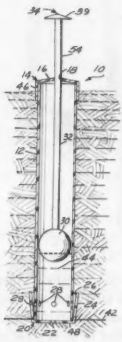
11. Liquid level means, comprising:

first means adapted to serve as a tubular housing;

float means adapted to fit loosely within the tubular housing so as to move freely, in a longitudinal direction, therewithin;

stem means adapted for use in cooperation with said float means in a manner to extend away therefrom;

said first means comprising a tubular body, top closure means for the tubular body, bottom closure means for the tubular body, and gutter means adapted to form a liquid receiving gutter around the base of said tubular housing; said tubular body having liquid inlet means near its lower end through which liquid from the gutter can flow into the tubular housing when the liquid level indicating means is in a normal position of use, said normal position of use being an upright one in which the tubular housing is buried with its top closure means up and at least partially exposed to view;



said top closure means having an opening adapted to receive said stem means and to permit it to move freely therethrough, the float means being positioned within the tubular housing, and said stem means being oriented and sized to extend through said opening at all times when said tubular housing is in said normal position of use;

whereby, when said tubular housing is buried in said normal position of use, liquid penetrating the surrounding burial medium flows into said gutter when it reaches the level of the latter, and from there into the tubular housing, causing said float means to rise and push said stem means upwardly through the opening in said top closure means to give visual indication of the liquid penetration to said level.

3,926,144

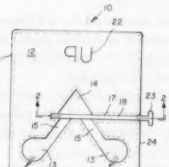
TILT OR INVERSION INDICATOR

William M. Lander, Horseheads, N.Y., assignor to Index Packages, Inc., Horseheads, N.Y.

Filed Nov. 6, 1974, Ser. No. 521,345

Int. Cl.² G01C *9/10*

U.S. Cl. 116—124 R **4 Claims**



1. In a tilt or inversion indicator having a storage chamber containing flowable colored particles and an indicator chamber into which said particles are free to flow through a con-

necting passageway upon tilting or inversion of said indicator, the improvement comprising:

a. said indicator being molded of transparent resin material;

b. said indicator having a generally plane back;

c. said storage and indicator chambers and said passageway being recessed forward relative to said plane back and being protected by said resin material;

d. printed material formed directly on said plane back around said storage and indicator chambers and said passageway to be read through said transparent resin from the front of said indicator;

e. a backing sheet covering over said printed material and said storage and indicator chambers;

f. adhesive means on the rear of said backing sheet for securing said back of said indicator to a container so said printed material is protected by said resin material and is visible through said resin material;

g. said indicator having an actuator channel extending transversely across said passageway and opening outward at one edge of said indicator;

h. a stop in said actuator channel;

i. a resin actuator rod housed in said actuator channel and extending outward from said one edge of said indicator for blocking said passageway until actuation of said indicator;

j. said rod being normally held in said blocking position in said channel by said backing sheet and being movable outward from said channel for unblocking said passageway to actuate said indicator; and

k. said rod having an abutment for engaging said stop in said channel to limit said outward sliding motion of said rod.

3,926,145

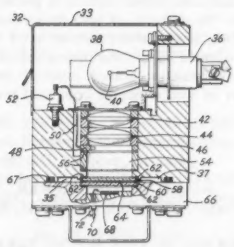
TONER CONCENTRATION DETECTOR

Robert M. Muth, Oklahoma City, Okla., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Mar. 4, 1974, Ser. No. 447,701

Int. Cl.² B05B 5/02

U.S. Cl. 118—7 **8 Claims**



1. In a printing apparatus for rendering visible a latent electrostatic image carried on a recording medium by applying to the medium at a toning station a working toner solution comprising a suspension of toner particles in a volatile carrier, improved means for maintaining a predetermined concentration of toner particles in the working toner solution comprising, in combination:

a reservoir of toner particles;

measuring means for continuously measuring the concentration of toner particles in the working toner solution, said measuring means including a light source,

a transparent chamber spaced apart from the light source to receive a continuously flowing stream of working toner solution,

first light detection means sensitive to light in the near infrared region of the light spectrum for measuring light intensity from the light source passing through the chamber, and means for transmitting light from the light source through the transparent chamber to the first light detection means along a first path having a first predetermined length;

second light detection means for detecting the intensity of light passed to said chamber from said light source;

means for providing current to the light source;

means for adjusting the current to the light source in response to said second light detection means to maintain a predetermined constant light intensity from the light source;

transfer means for transferring toner particles from the reservoir to the working toner solution at a predetermined rate; and

operation means responsive to the measuring means for operating the transfer means when the toner particle concentration decreases below a first predetermined value and for terminating the operation of the transfer means when the toner particle concentration increases to the first predetermined value.

3,926,146

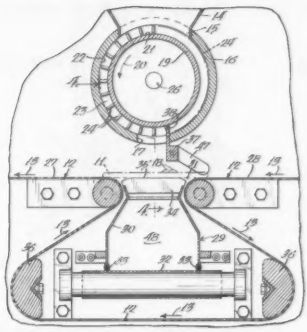
APPARATUS FOR DISTRIBUTING PARTICLES

Frederick Breyer; George T. Davis, and Edwin C. Krusche, all of Boca Raton, Fla., assignors to Hollymatic Corporation, Park Forest, Ill.

Filed Feb. 4, 1974, Ser. No. 439,249

Int. Cl.² B05B 3/02

U.S. Cl. 118—24 **1 Claim**



1. Apparatus for depositing an adherent particulate solid material on a traveling series of articles having spaced adjacent peripheries, comprising: conveyor means for transporting said articles through a depositing station; a dispensing housing above said conveyor means at said depositing station having an opening for depositing said material by gravity fall from the dispensing housing onto the articles as said articles are transported through the station with some of the material falling beyond and between said peripheries; a receiving hopper above and communicating with the dispensing housing for supplying material from the hopper to said housing; a recovery means at said depositing station for recovering said portions of material falling beyond and between said peripheries of said articles; a rotor in said dispensing housing having a peripheral surface spaced from said housing to provide a conduit passage between the rotor and housing for conveying of said adherent material from said hopper through said conduit passage and to said conveyor and the articles thereon by way of said passage; and spaced pins on said rotor substantially spanning said passage and rotatable with said rotor for engaging and moving said adherent material through said passage on rotation of the rotor without substantial compacting of said adherent material, said conveyor means comprising a pair of spaced horizontal reaches and said recovery means at said depositing station comprising a generally vertical open chute between said reaches having two longitudinal sides, a recovery conveyor

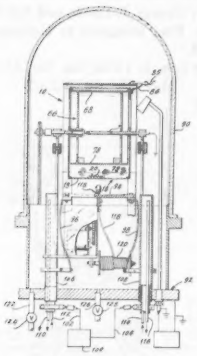
beneath the bottom of said chute and flexible guards on said chute bottom at said longitudinal sides engaging the recovery conveyor and closing the space between said chute bottom and guards and the conveyor to prevent substantial loss of said material laterally between the chute and the recovery conveyor.

3,926,147

GLOW DISCHARGE-TUMBLING VAPOR DEPOSITION APPARATUS

Kenneth E. Steube, St. Charles, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Nov. 15, 1974, Ser. No. 524,365
Int. Cl.² C23C *13/12*
U.S. Cl. 118—49.1 **14 Claims**



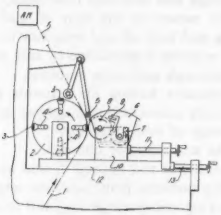
1. Means for plating articles comprising means forming an enclosed chamber, means for evacuating the chamber to establish a near vacuum condition therein, other means for introducing a gas into the evacuated chamber to raise the pressure in the chamber to a predetermined level, a source of a plating substance positioned in the chamber including means for evaporating the plating substance, the improvement comprising means for supporting a supply of articles to be plated in spaced relationship relative to the source of vaporized plating substance, said support means including a perforated wall member on which the articles to be plated are positioned, means for rotating the perforated wall member during the plating operation in such a way that the articles supported thereon tumble and present different surfaces to the source of vaporized plating substance, means connecting the perforated wall member to a source of relatively high negative electric potential, a relatively non-movable shield structure positioned adjacent to the perforated wall member above the articles to be plated thereon, means to maintain said non-movable shield structure at a relatively low electric potential, said shield structure having a portion positioned extending relatively closely in spaced relationship above the articles being plated and to the adjacent portion of the perforated wall member to define with said adjacent portion of the perforated wall member a chamber in which the articles being plated are located and restricted in the vertical component of tumbling movement and to define a relatively limited region of glow discharge.

3,926,148

APPLICATION OF ADHESIVE TO A MOVING WEB

Karl-Heinz Honsel, Heidelberger Weg 15, 48 Bielefeld, Germany

Division of Ser. No. 230,817, March 1, 1972, abandoned. This application Mar. 9, 1973, Ser. No. 339,943
Claims priority, application Germany, Mar. 5, 1971, 2110491
Int. Cl.² B05C *1/08, 1/16*
U.S. Cl. 118—247 **8 Claims**



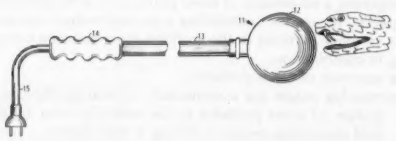
1. Apparatus for applying a self-adhesive material to a flat web, particularly to envelope blanks, comprising advancing means for advancing a flat web having two opposite major surfaces, in one direction; an adhesive carrier adjacent one of said major surfaces; transfer means, comprising a pressure-applying transfer roller located adjacent the other major surface and having a circumferential face and at least one pressure-exerting projection extending from said face for intermittent contact with the advancing web so as to press spaced portions of said one major surface into adhesive-transferring contact with said carrier; applying means, including an applying roller for applying to said carrier a self-adhesive material which tends to form a build-up on said adhesive carrier in the region where said one major surface is pressed against said adhesive carrier by portions of said projection; and moving means for moving said adhesive carrier in an opposite direction to, and at a speed higher than the speed of said web so as to prevent the formation of such build-up and consequent uneven transfer of said adhesive onto said major surface of said flat web.

3,926,149

SNAKE VENOM MILKER

Raymond D. Berger, 1504 40th Ave. Court, Rock Island, Ill. 61201

Filed Feb. 10, 1975, Ser. No. 548,883
Int. Cl.² A01K *29/00*
U.S. Cl. 119—1 **3 Claims**

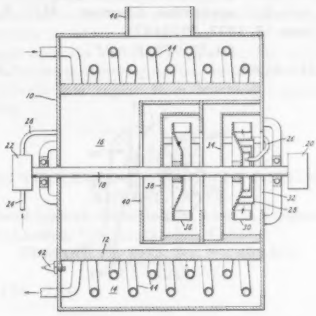


1. A snake venom milker comprising: a venom container having a wall of rubber-like material, said wall being of such thickness that it can be penetrated by the fangs of a snake and still not be torn by the snake, an extending handle, said venom container attached to one end of said handle, and heating means for warming said container.

3,926,150
VAPOR GENERATOR CARBURETION SYSTEM

Rudolf R. Laessig, West Chester, Pa., assignor to General Electric Company, Fairfield, Conn.

Filed June 3, 1974, Ser. No. 475,647
Int. Cl.² F22B *27/08*
U.S. Cl. 122—250 R **5 Claims**



1. In a vapor generator having a central plenum formed by a porous member for receiving a combustible mixture, an improved carburetion system comprising:

a rotatable member having secured thereto for rotation with it:

a liquid fuel pump,

a blower, and

a fuel atomizer/vaporizer;

means for rotating said rotatable member;

conveying means for delivering to said fuel atomizer/vaporizer fuel pumped by said liquid fuel pump;

said fuel atomizer/vaporizer directing atomized and/or vaporized fuel outwardly;

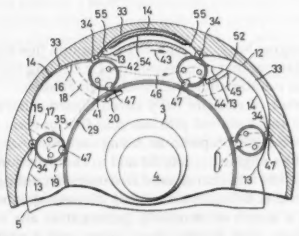
said blower positioned to mix said atomized and/or vaporized fuel with air and blow the mixture into said plenum; and

scroll means for converting the velocity of the mixture caused by said blower to a pressure head.

3,926,151
ROTARY PISTON COMBUSTION ENGINE

Johann Keylwert, Bensberg, Germany, assignor to Klockner-Humboldt-Deutz AG, Cologne, Germany

Filed Dec. 2, 1974, Ser. No. 528,999
Claims priority, application Germany, Dec. 14, 1974, 2362092
Int. Cl.² F02B *55/14*
U.S. Cl. 123—8.05 **8 Claims**

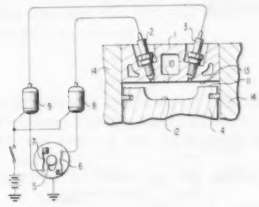


1. A rotary piston internal combustion engine comprising; housing means, piston means in the housing means and a shaft rotatably supported on the axis of the housing means and having eccentric means supporting said piston means, whereby relative rotation between said eccentric means and said piston means effects a change in the volume of fluid between said housing means and said piston means, said housing means when viewed in cross section comprising a plurality of radially inwardly concave arched regions, said piston means when viewed in cross section comprising radially outwardly convex arched regions amounting in number to a whole multiple of three, said piston means having intermediate portions at the junctures of adjacent arched regions which are nearest the axis of the piston means, said piston means being provided with overflow passage means extending circumferentially thereof and leading from near each third said intermediate portion of the piston means to near the following said intermediate portion of the piston means in the direction of rotation of the piston means, said overflow passage means providing fluid communication between two of said arched regions, conduit means for supplying a combustible mixture to the working chamber means formed between the piston means and housing means and for withdrawing products of combustion therefrom, combustion chamber means, and first and second conduit systems communicating said combustion chamber means with said working chamber means.

3,926,152
ROTARY PISTON INTERNAL COMBUSTION ENGINE

Hans O. Scherenberg, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Nov. 6, 1974, Ser. No. 521,463
Claims priority, application Germany, Nov. 7, 1973, 2355587
Int. Cl.² F02B *53/12*
U.S. Cl. 123—8.09 **10 Claims**



1. A rotary piston internal combustion engine with a housing casing, which includes an ignition means having at least two spark plugs at the housing casing, characterized in that said ignition means includes means providing an alternate ignition of the spark plugs with only one ignition in a respective compression volume of the combustion engine.

3,926,153
CLOSED THROTTLE TIP-IN CIRCUIT

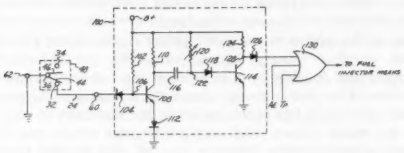
Junuthula N. Reddy, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 3, 1974, Ser. No. 457,680
Int. Cl.² F02M *51/00*
U.S. Cl. 123—32 EA **14 Claims**

1. In combination with an internal combustion engine fuel control system, having a source of electrical power, an electronic fuel control generating signals indicative of the engine's fuel requirements, fuel delivery means for delivering fuel to the engine in response to the signals generated by said fuel control computer and a throttle moveable intermediate a closed and a full open position to control the air delivery to the engine, an improvement comprising:

means for generating a closed throttle signal only when the throttle is in the closed position and for terminating said closed throttle signal when said throttle is intermediate said open and closed position;

input circuit portion means responsive to the termination of said closed throttle signals for generating a pulse width control signal each time said closed throttle signal is terminated; and



output circuit portion means including at least one output transistor switch for generating a fuel enrichment pulse signal in response to a pulse width control signal.

3,926,154

FUEL CONTROL SYSTEMS

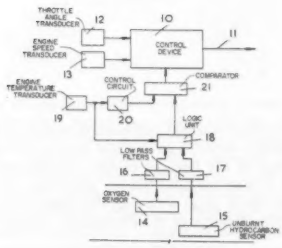
Malcolm Williams, Solihull, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed May 3, 1974, Ser. No. 466,886

Claims priority, application United Kingdom, May 4, 1973, 21446/73

Int. Cl.[2] F02B *3/00;* **F02M** *39/00*

U.S. Cl. 123—32 EA **6 Claims**



1. A fuel control system for an internal combustion engine comprising means for sensing the quantity of oxygen within the exhaust emission of the engine, means for sensing the quantity of carbon monoxide or unburnt hydrocarbon within the exhaust emission, means for measuring the temperature of the engine, control means for controlling the rate of supply of fuel to the engine in accordance with at least one engine parameter, and operation means coupled to said engine temperature measuring means and to said control means for modifying the quantity of fuel fed to the engine in accordance with engine temperature and the quantity of carbon monoxide or unburnt hydrocarbon within the exhaust emission when the engine temperature is below a predetermined value and in accordance with the quantity of oxygen within the exhaust emission when the engine temperature is above said predetermined value.

3,926,155

INTERNAL COMBUSTION ENGINE WITH SILENCING MEANS

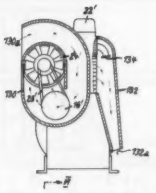
Ernst Hatz, Ruhstorf, and Johann Schmuck, Feilnbach, both of Germany, assignors to Motorenfabrik Hatz KG, Ruhstorf, Germany

Division of Ser. No. 358,337, May 8, 1973. This application Nov. 4, 1974, Ser. No. 520,825

Claims priority, application Germany, May 8, 1972, 2222556; June 15, 1972, 7222447

Int. Cl.[2] F01P *1/02*

U.S. Cl. 123—41.68 **3 Claims**



1. An internal combustion engine comprising at least one combustion cylinder, a cooling air conducting system including a cooling air blower associated with said cylinder, and sound muffling means incorporated in said cooling air conducting system wherein the conducting system comprises an air admission section in the form of tubular ducting which is disposed round said cooling air blower in spiral or volute form wherein said tubular ducting is provided with an air admission port substantially at the uppermost part thereof, and an air filter being disposed in the cooling air conducting system.

3,926,156

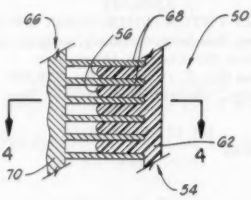
ENGINE DAMPENER MEANS

Eugene C. McCormick, P.O. Box 706, Wellington, Kans. 67152

Filed May 13, 1974, Ser. No. 469,427

Int. Cl. F02f *1/06, 1/30*

U.S. Cl. 123—41.69 **5 Claims**



1. In an engine having a plurality of cooling fins mounted in a spaced relation, that improvement of a cooling fin vibration dampener in combination therewith, comprising:

a. a member of resilient fully cured material having a first portion and a second portion, said first portion having at least two lug-like portions being mounted on opposite sides of an engine cooling fin and in compression between cooling fins adjacent to said first-named cooling fin, said lug portions being longitudinally elongated substantially, having a length substantially greater than any transverse dimension, and having their outer end portions being wider than the distance between said first-named fin and said fins adjacent thereto, said lug-like portions when mounted extending inward into the outer edge portions of said cooling fins with said outer end portions being essentially rounded in external shape;

b. said second portions connects end portions of said first portion to when mounted traverse ends of said cooling fins,

c. said first portion is integral with said second portion, and d. said dampener is constructed and adapted to be mounted and held in place on an engine solely by friction with said lug-like portions compressed between said fins, said cooling fin vibration dampener is constructed and adapted to in use reduce the normal operating natural frequency to which said cooling fins can be forced by normal operatio. of said engine thereby reducing the overall normal operating natural frequency of said engine to prevent said engine from reaching a resonant frequency.

3,926,157

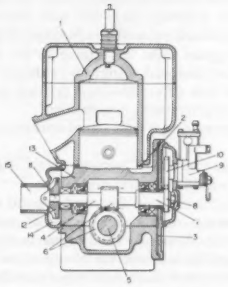
TWO-CYCLE ENGINE WITH INLET PORTING BY ROTARY VALVE

Hans Heinz Lippitsch, Gunskirchen, Austria, assignor to Bombardier Limited, Valcour, Quebec, Canada

Filed Oct. 12, 1973, Ser. No. 405,864

Int. Cl.² F01L *7/12*

U.S. Cl. 123—73 D **1 Claim**



1. A two-cycle engine with rotary valve induction control, comprising: an engine casing defining a crankcase; a crankshaft rotatably mounted in said casing to deliver power from said engine; a drive shaft rotatably mounted in said casing transversely of said crankshaft, worm gear means drivingly connecting said crankshaft to said driveshaft; a rotary valve means to control the supply of combustion mixture to said crankcase directly connected to said drive shaft at one end thereof for rotation thereby; at least one additional auxiliary system drivingly connected to the other end of said drive shaft, said at least one additional auxiliary system comprising a liquid coolant circulation pump having a housing which is at least in part integral with said casing and an impeller within said housing directly connected to said other end of said drive shaft for rotation thereby; an oil injection pump in said casing, said oil injection pump being gear driven and including a driven gear; and said rotary valve means including a hub comprising a driving pinion meshing with said driven gear.

3,926,158

SEGREGATED LEAN-RICH FED SPARK IGNITION ENGINE

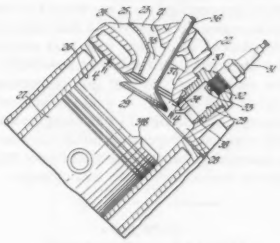
John Dolza, Sr., 810 State St., Fenton, Mich. 48430

Filed Jan. 2, 1974, Ser. No. 430,367

Int. Cl.² F02B *19/10*

U.S. Cl. 123—75 B **20 Claims**

1. In a spark ignition internal combustion engine having a power cylinder, a piston and a combustion chamber opposite the piston, an inlet valve openable into the combustion chamber toward the piston, an inlet passage communicating with the combustion chamber via the inlet valve, a fuel mixture segregation chamber adjacent the valve, said segregation chamber extending upwardly from the combustion chamber in a direction generally parallel with the longitudinal axis of the cylinder, said inlet passage having partitioning means therein defining a first passage sector for flow of spark ignitable fuel and air mixture into the portion of the combustion chamber nearest the segregation chamber during the suction stroke of the piston and a second passage sector for simultaneous flow of other gaseous fluid into the remainder of the combustion chamber, the combustion chamber end of the segregation



chamber having a deflector member for directing said spark ignitable mixture into the segregation chamber, a portion of said deflector member extending toward the longitudinal axis of the cylinder, a deflecting ridge on the piston operative to maintain a relatively rich mixture of said ignitable mixture and said other gaseous fluid adjacent the side of the cylinder nearest the segregation chamber during the compression stroke of the piston, and a spark plug having electrodes extending into the segregation chamber for initiating combustion of said spark ignitable mixture therein.

3,926,159

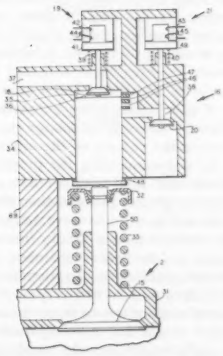
HIGH SPEED ENGINE VALVE ACTUATOR

Gunnar P. Michelson, 505 Sea Ranch Drive, Santa Barbara, Calif. 93105, and Louis A. Ule, 27 Mustang Road, Rolling Hills, Calif. 90274

Filed Mar. 25, 1974, Ser. No. 454,683

Int. Cl.² F01L *9/04*

U.S. Cl. 123—90.11 **8 Claims**



1. A control device comprising:

an internal combustion engine having at least one intake valve and one exhaust valve;

an hydraulic cylinder and piston assembly having a piston slidably disposed within a cylinder for actuating a respective one of said intake and exhaust valves;

pump and fluid supply means for supplying pressurized fluid to the interior of each cylinder of said assemblies so that said piston slides therein;

each of said assemblies having an inlet valve and an outlet valve, both disposed to open under the influence of said high pressure fluid;

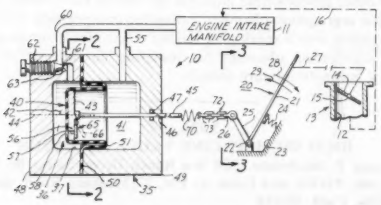
a solenoid for each one of said inlet and outlet valves, said solenoid being disposed to hold the respective inlet or outlet valve closed while energized;

a computer means responsive to the output of said internal combustion engine for supplying a first signal to deenergize said solenoid associated with said respective inlet valve and energizing said solenoid associated with said respective outlet valve, so that said respective piston is forced out of said cylinder by said pressurized fluid and for supplying a second signal to de-energize said solenoid associated with said respective outlet valve and energizing said solenoid associated with said inlet valve so that said piston is free to move into said cylinder.

3,926,160
ACCELERATOR DAMPER

Reed J. Husband, 650 Carroll Way, Pasadena, Calif. 91107

Filed Feb. 22, 1974, Ser. No. 445,277
Int. Cl.[2] F02D *11/08*
U.S. Cl. 123—103 E **23 Claims**

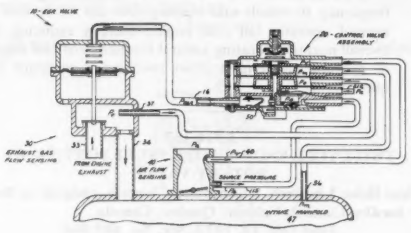


1. An accelerator damper for an accelerator that controls the supply of fuel to an engine which includes a source of fluid under pressure whose pressure increases when the engine is accelerated, the accelerator having a path of movement in a first direction to open a carburetor throttle, and in a second direction to permit the throttle to close, the accelerator damper comprising: a body enclosing a cavity; an internal wall at least partially bounding said cavity; a barrier in said cavity making a peripheral fluid-sealing fit with said internal wall so as to divide the cavity into a first and a second chamber, at least a portion of said barrier being bidirectionally movable along an axis whereby inversely to enlarge the volume of one chamber and reduce the volume of the other chamber; first conduit means for communicating the pressure source with said first chamber, said first chamber being that chamber which, when it holds a greater pressure than the second chamber, will cause the said portion to move and tend to close the throttle; second conduit means fluidly interconnecting the first conduit means and the second chamber; a bleed conduit means fluidly interconnecting the first conduit means and the second chamber; flow check means permitting fluid flow through the second conduit means from the second chamber to the first conduit means and resisting fluid flow in the reverse direction; and a restrictor in the bleed conduit means to limit the rate of fluid flow therethrough, the said movable portion of the barrier being adapted to be connected to the accelerator to resist movement of the accelerator in the first direction when the consequence of said movement is an increase of pressure in the pressure source.

3,926,161
EXHAUST GAS RECIRCULATION FLOW CONTROL SYSTEM

Harry P. Wertheimer, Horseheads, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 28, 1974, Ser. No. 446,856
Int. Cl.[2] F07M *25/06*
U.S. Cl. 123—119 A **30 Claims**



1. In combination with an internal combustion engine of the type having a carburetor with a venturi passage and a spark port, an intake manifold between said carburetor and the engine; a recirculated exhaust gas passage directing a portion of the exhaust gases from the engine to the intake manifold and valve means disposed within said exhaust gas passage for controlling the flow of recirculated exhaust gas to the intake manifold, the improvement comprising:

means for generating a first signal corresponding to engine air flow;

means for generating a second signal corresponding to intake manifold pressure; and

means for receiving said first and second signals, said receiving means operative to control said valve means whereby the flow of exhaust gas recirculated to said intake manifold is a function of engine air flow and intake manifold pressure, said receiving means further including means for receiving a third signal corresponding to recirculated exhaust gas flow, so that said receiving means is operative to maintain the flow through said recirculated exhaust gas passage as a function of said first, second and third signals.

3,926,162
FUEL CONTROL APPARATUS

Elmer A. Haase, and James M. Kirwin, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Dec. 19, 1973, Ser. No. 426,397
Int. Cl.[2] F02D *1/04*
U.S. Cl. 123—139 A **5 Claims**

1. Fuel control apparatus for a combustion engine having an air intake comprising:

fuel conduit means having an inlet connected to a source of pressurized fuel and an outlet connected to supply metered fuel to the engine;

first valve means including a metering restriction and a valve member for varying the flow area of said metering restriction in said fuel conduit means for controlling fuel flow therethrough;

second valve means operatively connected to said fuel conduit means for controlling the fuel pressure differential across said restriction and thus the flow of fuel therethrough to said engine;

an air pressure differential responsive means operatively connected to said air intake and responsive to a control air pressure differential indicative of mass air flow consumed by the engine;

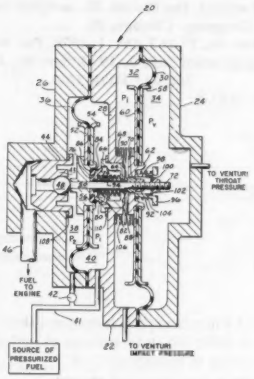
a fuel pressure differential responsive means operatively connected to said fuel conduit and responsive to the fuel pressure differential across said restriction;

a fixed wall separating said air and fuel pressure differential responsive means;

an opening in said fixed wall;

a control rod extending through said opening for axial movement relative thereto and operatively connected to said valve member and said air and fuel pressure differential responsive means for actuating said valve member to establish a force balance on said control rod; and

a bellows fixedly secured at one end to said wall coaxial with said opening and fixedly secured at the opposite end to said control rod coaxial therewith for preventing fluid communication between said air and fuel pressure differential responsive means and resiliently supporting said control rod for axial movement through said opening;



said control rod having an effective range of axial movement of approximately 0.010 inches such that the compression of said bellows is limited accordingly;

said bellows having an outer diameter of approximately 0.220 inches and a mean effective area substantially equal to the flow area of said valve orifice;

and wherein said fuel pressure differential responsive means is provided with a central portion having a recess therein adapted to receive an annular resilient seal member;

a circular member having a central opening through which said rod extends and a radially extending flange portion adapted to bear against said resilient seal member;

means including a fastener threadedly engaged with said rod for urging said circular member against said annular seal member to compress same thereby establishing a fluid seal.

3,926,163

METHOD AND DEVICE FOR STOPPING AN INTERNAL COMBUSTION ENGINE WITH FUEL INJECTION IN CASE OF OVERSPEED

Dirk Bastenhof, Eaubonne, France, assignor to Societe d'Etudes de Machines Thermiques, Saint Denis, France

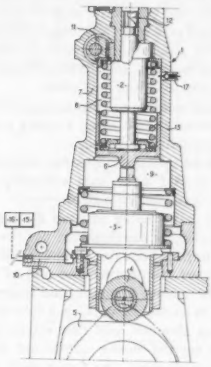
Filed May 28, 1974, Ser. No. 473,940

Claims priority, application France, June 26, 1973, 73.23380

Int. Cl.² F02B *77/00*

U.S. Cl. 123—139 AZ **11 Claims**

4. A device for stopping an internal combustion engine in case of overspeed including fuel injection pumps of the constant-stroke, reciprocating piston type, each of said pumps comprising a pump body, a piston, a drive tappet for driving the piston, a hollow cylinder closed at one end and slidably mounted within said pump body between said piston and said tappet and defining within said pump body a pair of separated closed chambers, a first one of which contains said piston and the second one of which contains said tappet, said device comprising a source of pressurized gaseous fluid, and means for providing a communication between said source and said second chamber for feeding said pressurized gaseous fluid into



said second chamber, said gaseous fluid having a pressure high enough for disengaging and separating said hollow cylinder and thereby said piston from said drive tappet to thereby stop said injection pump.

3,926,164

REGULATING DEVICES FOR THE FLOW OF FUEL FOR INTERNAL COMBUSTION ENGINES

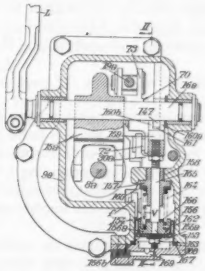
Andre Vuaille, Lyon, France, assignor to Societe Industrielle Generale de Mecanique Appliquee S.I.G.M.A., France

Filed May 21, 1973, Ser. No. 362,360

Claims priority, application France, June 6, 1972, 72.20364

Int. Cl.² F02D *1/04, 1/06*

U.S. Cl. 123—140 FG **2 Claims**



1. Device for regulating the flow rate per revolution of an injection pump for an internal combustion engine, comprising:

a centrifugal regulator sensitive to the rotary speed of the engine, comprising a pusher element slideable along the axial direction of the centrifugal regulator,

elastic means operating in a direction opposite to the direction of operation of the centrifugal regulator, said elastic means having a tension which depends upon the position of an accelerator,

a regulating member for regulating the flow rate per revolution of the pump,

linking means between the pusher element and the flow rate regulating member, comprising at least one transmission lever respectively connected to the pusher element and to the flow-rate per revolution regulating member, a middle

portion of this transmission lever being mounted on pivoting means borne by a casing in which is housed the regulating device,

said pivoting means of the transmission lever comprising a pivot borne by the casing and a pivoting axle of said lever fast to the pivot, the geometric axis of this pivoting axle being parallel and eccentric with respect to the geometric axis of the pivot, said pivot and said pivoting axis being fast to a linking element, said linking element being situated between said axle and said pivot,

said pivoting means enabling a displacement of the geometric axis of rotation of said lever, causing a movement of the flow rate regulating member,

and actuating means for controlling the displacement of the pivoting axle of said lever, said actuating means being sensitive to the pressure of a fluid,

said transmission lever being pivoted by one end on the regulating member for the flow rate per revolution of the pump and, by its other end, on an intermediate lever, said intermediate lever connecting one end of the transmission lever to the pusher element, said intermediate lever being pivoted, in its middle part, on a first sleeve movable with the pusher element, said first sleeve being slidably mounted in a second sleeve connected for translation with said pusher element, the first-named elastic means being in abutment against said first sleeve, and a further elastic means being provided between said first sleeve and said second sleeve so as to enable relative movement of said two sleeves which causes rotation of the levers and movement of the flow rate regulating member.

3,926,165

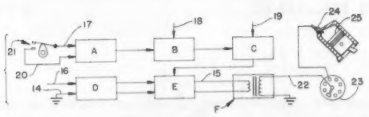
MULTIPLE SPARK DISCHARGE SYSTEM

James Walter Merrick, El Paso, Tex., assignor to Autotronic Controls Corporation, El Paso, Tex.

Filed Feb. 11, 1974, Ser. No. 440,996

Int. Cl.² F02P 1/00

U.S. Cl. 123—148 E **14 Claims**



1. In an internal combustion engine having a combustion chamber within which an ignition spark is to be provided with the spark occuring in timed sequence respective to engine rotation, said engine having means providing a timing signal, a DC current source, and a distributor connected to deliver high voltage current for the spark; the improvement comprising:

a multiple spark discharge apparatus for delivering current to the distributor in response to said timing signal; said discharge apparatus including means forming a multiple spark discharge control circuit connected to deliver multiple strikes for said spark when said circuit is energized; means, including circuitry, forming a DC/DC converter for increasing the voltage of said DC current source, and connected to supply current to said multiple spark discharge control circuit;

a firing duration control circuit means connected to said multiple spark discharge control circuit for controlling the duration of firing each time said timing signal is received;

an engine timing control circuit means for changing the time of firing respective to engine rotation; said engine timing control circuit means divides the firing interval between successive firing pulses into first and second intervals, means by which the ratio of said first and second intervals is made proportional to a first and second current source, and means for adjusting one said current source to thereby provide an adjustable ignition timing signal;

an engine timing signal conditioning circuit means connected to said engine timing control circuit for conditioning the timing signal, to thereby provide a signal for driving said engine timing control circuit;

so that a spark of multi-strikes is provided for initiating combustion each stroke of the internal combustion engine with the duration and time of the multi-strikes being controlled.

3,926,166

RING MANUFACTURE, PRODUCTIVE OF LINE CONTACT SEAL

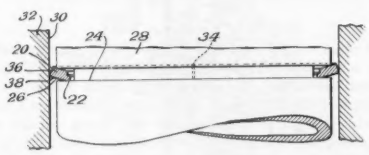
Norman M. Packard, Des Plaines, Ill., assignor to International Harvester Company, Chicago, Ill.

Division of Ser. No. 77,163, Oct. 1, 1970, Pat. No. 3,826,508.

This application June 3, 1974, Ser. No. 475,558

Int. Cl.² F02F 5/00

U.S. Cl. 123—193 P **6 Claims**



1. In engines wherein sealing is accomplished by split piston rings which, in collapsed state, become closed or substantially so as when sealing in operation:

piston having a ring receiving groove;

split ring therein having at least one side, and a face and a back adjacent the side and respectively adjoining same at the side of the ring and forming corners therewith at that side;

said receiving groove having a side which confronts the said one side of the ring so as to be sealed thereby;

said one side of the ring being generally frusto conical when the ring is in collapsed state, said one side as viewed in cross section in that state presenting an inner periphery, which is characterized by having all points thereof planar to one another so as to limit out-of-flatness to no more than about 5 to 10 light bands at standard inspection wavelength and which is effective during operation to establish a substantially continuous ring of pressure contact with the confronting side of the groove sealed thereby; and

cylinder slidably receiving the piston and engaging the face of the ring to retain the latter at all times in collapsed state on the piston.

3,926,167

STARTING CIRCUIT FOR ENGINE UTILIZING FUEL INJECTION PUMP

Lionel S. Camp, Auburndale, Fla., assignor to M. Bruce Woods, Orlando and Julian C. Renfro, Winter Park, both of, Fla.; part interest to each

Filed Aug. 26, 1971, Ser. No. 175,295

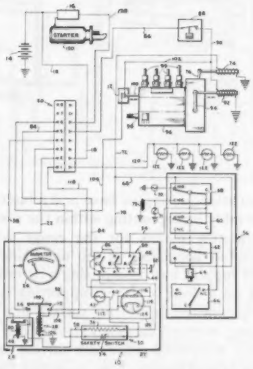
Int. Cl.² F02N 17/00

U.S. Cl. 123—179 L **8 Claims**

5. An automatic starting device for automatically accomplishing a starting cycle for an engine that utilizes a fuel pump for supplying metered quantities of fuel and which pump has a control rod that is in an extended position when the engine is not operating, and in a retracted position when the engine is operating at a selected speed, said engine also having a battery, an electric starter, and electrically heated glow plugs for preheating the engine prior to energizing the starter, said starting device comprising:

a. normally open starter switch means, said switch means in operative electrical connection with the starter and the battery;

b. electrical heating means disposed closely adjacent said starter switch means, said starter switch means being actuated to a closed position by the heat generated by said electric heating means at a predetermined temperature thereof, said electric heating means being connected in series with the glow plugs and arranged to reach such predetermined temperature coincident in time with such glow plugs achieving a selected engine preheat temperature;



c. starting cycle switch means, said starting cycle switch means being connected functionally in series with said electric heating means, and arranged to be in a closed position when the pump control rod is in an extended position, and to be in an open position when the control rod is in a retracted position; and

d. temperature-responsive switch means, said temperature-responsive switch means being connected in series with said starting cycle switch means and electrically connected to the battery.

3,926,168

SINGLE STAGE COLD START AND EVAPORATIVE CONTROL SYSTEM USING A BIMODAL ADSORBENT BED

Sigmund M. Csicsery, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 295,028, Oct. 4, 1972, Pat. No. 3,831,572. This application Mar. 6, 1974, Ser. No. 448,773

Int. Cl.[2] F02M *1/16*

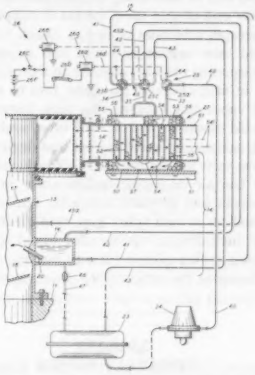
U.S. Cl. 123—180 R **8 Claims**

1. In a spark-ignition internal combustion engine of the type having an air intake system, a fuel system, and a mixing means interconnected therebetween for mixing of full-range fuel with air to form a combustible mixture for delivery to combustion chambers of said engine, the improvement for reducing exhaust pollutants of said engine by (i) dynamically varying the composition of said full-range fuel during cold starting of said engine (cold start cycle) and (ii) alternatively adsorbing evaporative emissions originating from vapor zones within said fuel system at least during an inoperative state of said engine, comprising:

i. cannister means selectively connectable between said mixing means and a reservoir of said full-range fuel and including an adsorption bed of adsorbent material,

ii. control means for controlling fluid flow including liquid fuel as well as vapor emission flow between said reservoir means, said cannister means and said mixing means as a function of selected operating parameters,

iii. said control means including at least first and second condition means for alternatively (i) initiating, during said cold start cycle, flow of said full-range fuel from said reservoir to said cannister means and hence over said



adsorption bed so as to elute a cold start fuel effluent composed essentially of low molecular weight liquid constituents, said effluent being passed to said mixing means in sufficient amounts to assure starting of said engine, and (ii) permitting flow of evaporation vapors from said vapor zones of said fuel system to said same adsorption bed for capture thereon, at least during said inoperative state of said engine.

3,926,169

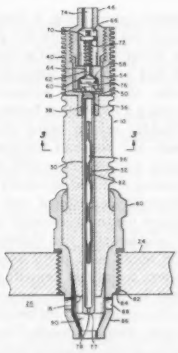
COMBINED FUEL VAPOR INJECTOR AND IGNITER SYSTEM FOR INTERNAL COMBUSTION ENGINES

Ervin Leshner, and Michael D. Leshner, both of Cherry Hill, N.J., assignors to Fuel Injection Development Corporation, Bellmawr, N.J.

Filed June 21, 1974, Ser. No. 481,702

Int. Cl.[2] F02B *19/10, 19/18*

U.S. Cl. 123—32 SJ **35 Claims**



1. In combination with an internal combustion engine having a combustion chamber and means to selectively supply air

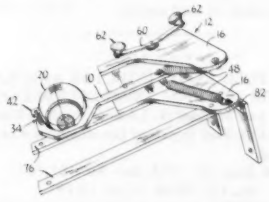
or an air-fuel mixture thereto, a combined fuel vapor injector and igniter comprising an insulating body, an electrically conductive member securing said body to said chamber and including a first electrode extending into said chamber, a heat electrically conductive vaporizing tube extending through said insulating body and into said chamber serving as a second electrode and terminating in an end adjacent said first electrode to provide a spark gap therebetween, a fuel vapor exit orifice at said end of said tube, a liquid fuel inlet orifice adjacent the other end of said tube, means to supply liquid fuel to said tube through said inlet orifice, a check valve interposed between said inlet orifice and said fuel supply means, said check valve opening only in response to a predetermined drop in pressure in said chamber to allow fuel to enter said inlet orifice, said vaporizing tube having been heated by the combustion in said chamber and in said tube, and means to provide a spark across said spark gap at and during the time fuel in vapor form exits into said chamber from said exit orifice to admix with the air or an air-fuel mixture in said chamber supplied thereto and produce a readily ignitable mixture of fuel vapor and air at said spark gap, said electrically conductive member including an open-ended shield surrounding said fuel vapor exit orifice of said tube to confine the exiting fuel vapor and increase the ratio of fuel to air in said shield.

3,926,170

FOOTBALL PASSER

Jack R. Dixon, Miami, Okla., assignor to Indian Head, Inc., New York, N.Y.

Filed Oct. 9, 1973, Ser. No. 404,497
Int. Cl.² F41B *3/04*
U.S. Cl. 124—8 **23 Claims**



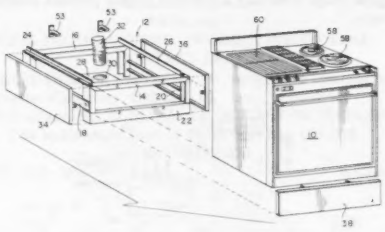
13. A football passer comprising a frame; an elongated throwing arm mounted on the frame for pivotal movement relative to the frame about an axis that is more nearly vertical than horizontal and that is located adjacent one end of said arm, the throwing arm also having adjacent its other end a holder means for holding a football; a football received in the holder means, the holder means being shaped and dimensioned to nest loosely the football therein and enable the football to roll generally radially outwardly with respect to the pivot axis of the throwing arm and upwardly out of the holder means upon imposition of centrifugal and tangential forces thereon; and propulsion means associated with the throwing arm and frame for accelerating the throwing arm pivotally relative to the frame about said pivot axis and moving the holder means in an arc, to impart centrifugal and tangential forces to the football in the holder means and propel the football from the holder means and for decelerating the pivoting of the throwing arm after the football has been propelled out of the holder means as the throwing arm traverses said arc without abruptly and substantially slowing the movement of the throwing arm and the holder means such that the throwing arm follows through smoothly and simulates natural arm motion of a human passer.

3,926,171

BASE FOR A VENTILATED COOKING RANGE

Edwin J. Kurek, and Joseph J. Cerola, both of Indianapolis, Ind., assignors to Jenn Air Corporation, Indianapolis, Ind.

Filed Mar. 16, 1972, Ser. No. 235,277
Int. Cl.² F24C *15/32*
U.S. Cl. 126—21 A **2 Claims**



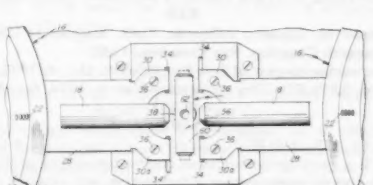
1. In combination, a support base and a built-in type cooking range assembly incorporating within the range assembly a powered ventilating means for the range which exhausts through a conduit accessible at the underside of the range assembly, said support base comprising a rectangular box-like frame resting on a floor or other supporting surface with its lower face adjacent the supporting surface and its upper face accommodating, in overlying relation, the base portion of the range assembly, horizontal guide rails carried on two opposite upper margins of said support base providing for sliding insertion of the range assembly into overlying relation to said support base, a discharge duct accommodated within said support base frame with its entrance supported by said frame adjacent the upper face thereof and adapted for registering connection to the range ventilating means exhaust conduit when the range assembly is in place on said support base.

3,926,172

ELECTRIC IGNITER FOR GAS BURNERS

Domenick Saponara, Macungie, Pa., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 29, 1974, Ser. No. 518,440
Int. Cl.² F24C *3/10*
U.S. Cl. 126—39 E **21 Claims**

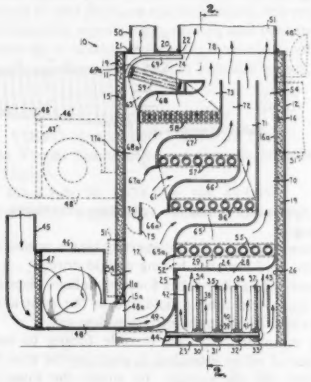


1. An electrical igniter electrode comprising an insulating support having an aperture therethrough, a lead comprising an electrically conducting wire having an end portion positioned within said aperture, and mechanical gripping means attached to said end portion of the lead for retaining said lead in said aperture, said gripping means being a threaded metal member disposed at least partially internally of and in threaded engagement with the end of the wire and in electrical contact therewith.

3,926,173
FURNACE AND COLD AIR RETURN SYSTEMS

Gene R. Jury, 125 Ridgeway Drive, Greenwood, Mo. 64034

Filed July 15, 1974, Ser. No. 488,564
Int. Cl.² F24H *3/00, 3/02*
U.S. Cl. 126—110 R 12 Claims



1. A method of extracting heat from a heat source exhausting heated gases adjacent a forced air circulating heating system, said forced air system having at least one cold air return duct and a hot air circulation duct positioned adjacent one another, comprising the steps of:

establishing a heat extraction chamber communicating between the cold air return duct and the hot air circulation duct,

flowing the exhaust gases from the heat source substantially horizontally through the heat extraction chamber (back and forth) sequentially at a plurality of vertically spaced apart levels therein through a plurality of vertically spaced apart banks of heat exchanging tubes, moving from lower to higher levels in said banks,

flowing cold air from the cold air return duct into the lower portion of said chamber,

dividing the cold air input flow into the heat extraction chamber therewithin into as many parts as there are banks of heat exchange tubes and flowing same upwardly in a separated set of vertically spaced apart, individual flows, one flow through each one of said banks,

exhausting the then heated air from the heat extraction chamber overhead therefrom into the hot air duct, and

venting the exhaust gases after passing same through the topmost bank of heat exchange tubes,

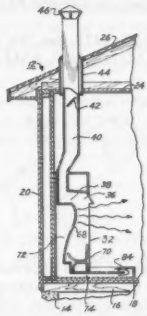
---

3,926,174
FIREPLACE STRUCTURE

Ralph E. Bell, 308 E. Wabash Ave., Wakarusa, Ind. 46573

Filed Feb. 21, 1974, Ser. No. 444,273
Int. Cl.² F24B *7/00*
U.S. Cl. 126—121 9 Claims

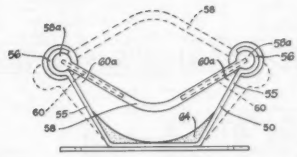
1. A prefabricated movable fireplace structure comprising walls defining a housing having a bottom, two side walls and a rear wall, a firebox in said housing having a bottom, two side walls and a rear wall of sheet metal and an open front, said firebox walls being spaced from the respective walls of said housing to form an air passageway beneath and at the sides and back of the firebox to heat the air in the passageway, and to provide an insulating effect for the walls and bottom of the housing, baffles joined integrally with the rear wall of said firebox and disposed in said passageway along the back of said firebox for dissipating heat from the firebox into the air flowing in said passageway, means forming outlets near the bottom for directing heated air outwardly at a low level from said passageway, blower means for moving the air downwardly in said passageway around said baffles, a flue connected to said firebox and extending upwardly therefrom, and a hearth disposed in front of said firebox and having an air conduit means with an outlet opening facing the front of the firebox for supplying air from an outside source to the firebox.



3,926,175
IMPLANTABLE VALVE FOR MEDICAL PURPOSES

James H. Allen, 4282 Senisa, Irvine, Calif. 92664, and Frederic L. Green, 110 Sea View Drive, El Cerrito, Calif. 94530

Filed June 3, 1974, Ser. No. 475,528
Int. Cl.² A61B *19/00;* A61F *1/24*
U.S. Cl. 128—1 R 10 Claims



1. A valve adapted to be implanted in the body of a human or animal to control the flow of a fluid through a conduit, said valve comprising:

a circumscribing structure adapted to at least substantially circumscribe the conduit, said circumscribing structure being separable to permit the circumscribing structure to receive the conduit without requiring ligation of the conduit;

said circumscribing structure including a body section adapted to at least partially circumscribe the conduit and a movable section;

means for mounting said movable section on said body section;

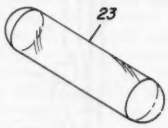
said movable section being movable relative to said body section along a path having a radial component between first and second positions, said first position being radially outwardly of said section position whereby said circumscribing section can compressively load and restrict the flow of fluid through the conduit in said section position; and

said body section having at least one resilient portion, said resilient portion being cooperable with said movable section to at least partially define an over center device whereby said movable section tends to remain in whichever of said first and second positions it is placed.

3,926,176
RADIOACTIVE GAS-CONTAINING POLYMERIC CAPSULE

Harry S. Winchell, Lafayette, and Robert E. Lewis, Pleasanton, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Aug. 15, 1973, Ser. No. 388,700
Int. Cl.[2] G21F 5/00; A61J 1/06
U.S. Cl. 128—1.2 18 Claims

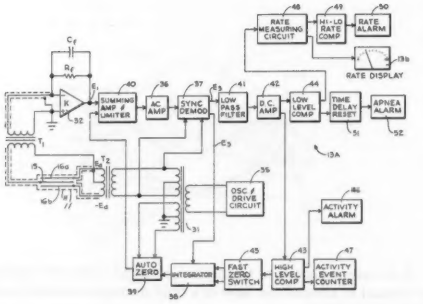


1. A capsule comprising a gas impermeable polymeric enclosure selected from the group consisting of vinyl-vinylidene chloride, polyethylene-terephthalate, and polysulfone, said enclosure containing a gaseous radioisotope therein and a physiologically benign absorbent for radiolysis products of the capsule enclosure material.

3,926,177
ACTIVITY AND RESPIRATION MONITOR

Edward V. Hardway, Jr., Houston, and William H. Holtman, La Porte, both of Tex., assignors to Cavitron Corporation, New York, N.Y.

Filed Sept. 11, 1972, Ser. No. 287,844
Int. Cl. A61b 5/00
U.S. Cl. 128—2 S 2 Claims



1. Apparatus responsive to movement of the body of a human or animal to provide an indication of a condition of such a body, comprising, in combination:

a resilient, capacitive pad adapted to respond to movement of such a body when disposed over the pad to provide a capacitance change, said pad including at least two electrodes extending beneath a substantial portion of the upper surface area of said pad, and a dielectric between said electrodes;

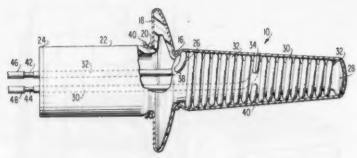
electrical driving signal means;

capacitance sensing means; means for connecting said driving signal means and said sensing means to said electrodes; said sensing means being responsive to said capacitance change to provide an output signal representing said indication, said sensing means comprising an electronic high pass filter for substantially rejecting changes in capacitance of said pad of relatively long term as compared to the term of capacitance changes caused by the condition being indicated, and means for shortening the response time of said high pass filter when such activity exceeds a predetermined level.

3,926,178
APPARATUS FOR AIDING THE VOLUNTARY EXERCISING OF SPHINCTER MUSCLES

Alvin N. Feldzamen, 55 East St., Annapolis, Md. 21401

Filed Jan. 17, 1975, Ser. No. 541,830
Int. Cl.[2] A61B 5/00
U.S. Cl. 128—2 S 10 Claims



1. An apparatus to aid the voluntary exercising of muscles comprising:

a member adapted to be inserted into a sphincter muscle cavity, said member having a rigid core;

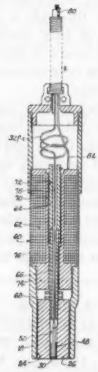
a plurality of flexible tubes forming helices disposed around the core, said tubing yieldable to the contractive forces exercised by the sphincter muscles; and

means connected to said flexible tubing to indicate the degree of effort intended to exercise the muscles against helices and the rapidity by which the muscles can be contracted and relaxed.

3,926,179
BLOOD PRESSURE MEASURING APPARATUS

Jeffrey C. Petzke, Middleton, and Dennis E. Bahr, Madison, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Apr. 3, 1974, Ser. No. 457,485
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—2.05 N 11 Claims



1. Apparatus for measuring the blood pressure in an artery near the surface of a body member,

comprising a blood pressure probe having a housing for engaging the body member,

said probe including a pressure applying member movably mounted in said housing for engaging the surface of the body member over said artery,

power operated pressure exerting means on said probe for pressing said pressure applying member against the surface of said body member to produce a degree of flattening of said artery,

a sensor in said pressure applying member for engaging the surface of said body member over said artery to sense the pressure pulses in said artery,

said sensor including a transducer for producing electrical signals corresponding to said pressure pulses,

and control means having an input circuit for receiving said electrical signals and power output regulating means connected to said pressure exerting means and responsive to said electrical signals for operating said pressure exerting means in a variable manner to maximize said electrical signals corresponding to said pressure pulses.

3,926,180

VIBRO-MASSAGING APPARATUS

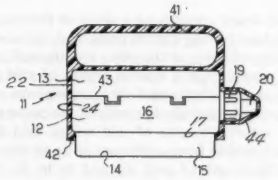
Claude Jean Virgile Zambelli, 6, rue Cattulle Mendes, Paris, France (75017)

Filed July 30, 1974, Ser. No. 493,075

Claims priority, application France, July 30, 1973, 73.27853

Int. Cl.² A61H *1/00*

U.S. Cl. 128—32 **5 Claims**



1. A vibro-massaging apparatus comprising:

a housing consisting of a body and a cover, said body and said cover joined together by a seal, said body including a massaging face and a shoulder located between said seal of said body and said cover; and

an impermeable flexible casing covering said housing beyond said seal between said body and said cover, said casing having a roll bordering an aperture of said casing which cooperates with said shoulder and having a junction between said casing and said body which is watertight.

3,926,181

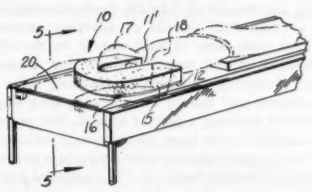
CERVICAL-DORSAL RELAXATION PAD

Clement G. Eischen, Sr., 601 NE. 167th Place, Portland, Oreg. 97230

Continuation-in-part of Ser. No. 352,199, April 18, 1973, abandoned. This application Jan. 2, 1974, Ser. No. 430,220

Int. Cl. A61f *5/00*

U.S. Cl. 128—68 **13 Claims**



1. A device for supporting a user's head and shoulders above a supportive surface when such user is lying face down; said device comprising an elongate resilient pad having a substantially planar upper surface, said pad having an elongate opening defined therein opening to said upper surface, extending longitudinally of the pad and terminating short of one end of said pad, said opening having such width that opposed upper marginal edge portions of the pad on opposite sides of said opening may support the cheek regions of the user's face and an upper marginal edge portion of the pad adjacent said opening and said one end of the pad may support the user's forehead, said opening having such depth that portions of the user's face between said opposed edge margins are untouched by said pad, said pad having such length that when the user's forehead is resting on said marginal edge portion of the pad adjacent said one end of the pad the opposite end of the pad underlies and supports the user's shoulders above said supportive surface.

3,926,182

LUMBAR TRACTION APPARATUS

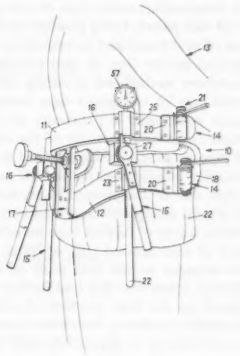
Ludvig M. Stabholz, Netanya, Israel, assignor to Meditrac, Beni Brak, Israel

Filed Jan. 24, 1974, Ser. No. 436,219

Claims priority, application Israel, Jan. 29, 1973, 41411

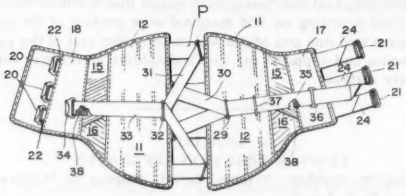
Int. Cl.² A61H *1/02*

U.S. Cl. 128—75 **12 Claims**



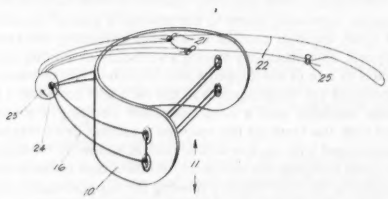
1. Lumbar traction apparatus comprising a pair of upper and lower U-shaped supports adapted to be attached to the upper and lower waist portions respectively of a patient undergoing treatment; a belt assembly associated with each of the supports for tightening them to the patient; a pair of laterally spaced apart traction control assemblies extending between the supports, each assembly having a vertically extending tube connected to one of the supports and a toothed rod telescopically mounted for reciprocation in the tube and connected to the other support, and a rotatable shaft carrying a pinion engaged with the teeth on the rod; and a ratchet drive mechanism associated with each traction control assembly for rotating the shaft carrying the pinion in one direction to move the rod relative to the tube thereby moving the supports apart and applying traction to the lower lumbar region of the patient (1), wherein the belt assembly associated with each of the supports comprises a belt, one end of which is adapted to be releasably attached to one leg of the support and the other end of which is wrapped around a rotatable shaft mounted on the other leg of the support, and a ratchet drive mechanism associated with each belt for rotating the shaft in one direction to wind the belt thereon and thereby tighten the support to the patient.

3,926,183
DORSAL LUMBO SACRAL SUPPORT
Irving Spiro, Miami, Fla., assignor to All Orthopedic Appliances Inc., Miami, Fla.
Filed Nov. 27, 1974, Ser. No. 527,884
Int. Cl.² A61F 5/02
U.S. Cl. 128—78 **3 Claims**



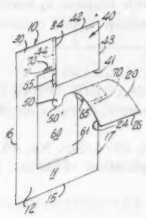
1. A support for a person's back comprising a pair of panel members adapted to be fitted about a person's torso at the position of his back, a plurality of fastening members mounted along one edge portion of each of said panel members for securing said panels at the front portion of the torso, a pair of loops mounted on the other edges of each of said panels, said loops of one of said panels being positioned in proximity of a top and bottom edge portion of said panel and substantially equidistant from a longitudinal center line of said panels, said loops of the other of said panels being positioned in proximity of said mid-portion of said panel and substantially equidistant from said longitudinal center line of said panels, a pair of elongated tape members having end portions, said end portions of one of said pair of elongated tape members being secured to said loops positioned in proximity of said top and bottom edge portions, said end portions of the other of said pair of elongated tape members being secured to said loops positioned in proximity of said mid-portion of said panel, a second pair of loops, one of last named loops being slidably mounted on each of said elongated tape members intermediate their end portions, a pair of further tape members secured at one end to each of said second pair of loops, adjustable fastening members secured to the free ends of said further tape members whereby upon drawing said further tape members about said panels to the front portion of said torso and fastening said adjustable fastening members equal pressures will be exerted by said panels in supporting said torso.

3,926,184
PENIS ENCIRCLING DEVICE
Fred J. Gehl, U.S. 50, P.O. Box 144, Loogootee, Ind. 47553
Filed Sept. 4, 1974, Ser. No. 503,486
Int. Cl.² A61F 5/00
U.S. Cl. 128—79 **4 Claims**



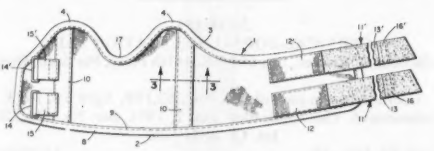
1. In a device of the type including clasping means to encircle the human penis, tightening means to control the pressure exerted by said clasping means, and securing means for maintaining said tightening means at a constant pressure the improvement comprising tension means connected to said clasping means for causing movement of a user's head and neck to apply force to said clasping means, said tension means having a portion which encircles the neck of the user.

3,926,185
SURGICAL DRAPE
Henrietta K. Krzewinski, Old Bridge, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.
Filed Dec. 12, 1974, Ser. No. 532,282
Int. Cl.² A61F 13/00
U.S. Cl. 128—132 D **30 Claims**



1. A surgical drape comprising a sheet of flexible drapable material, said sheet having a main portion at one end thereof, and a pair of spaced wings at the other end thereof, said wings extending outwardly from a central region of said sheet and defining a slit in said sheet; said slit merging into a widened fenestration located generally inwardly of the perimeter of the drape; a flap secured to one of said wings, said flap being transversely extendible from said wing so as to cover at least a portion of the length of said slit and to be in contacting relationship with at least part of the other of said pair of wings when the drape is in use; and means on said drape for preventing said wings from moving with respect to each other when the drape is in use.

3,926,186
MUSCULAR SUPPORT
Robert P. Nirschl, 4143 N. River St., Arlington, Va. 22207
Continuation-in-part of Ser. No. 345,370, March 27, 1973, Pat. No. 3,877,426. This application May 28, 1974, Ser. No. 473,878
Int. Cl.² A61F 13/00
U.S. Cl. 128—165 **9 Claims**



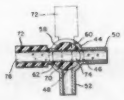
1. A support device capable of being wrapped about and surrounding the muscle of a bodily limb or member without extensive overlap and capable of applying circumferential pressure to a wide area of said muscle to thereby relieve internal tension of the muscle, comprising a substantially curvilinear, elongated pad having one long edge convexly arcuately shaped and having an opposing long edge with a portion thereof forming a pair of spaced, flat projections of said pad extending away from said convexly arcuately shaped long edge, said opposing long edge being of a predetermined length measured longitudinally of said elongated pad such that such support device will be of generally conical shape when wrapped about the muscle of said bodily limb or member, said pad being flexible in all directions and comprising a laminate having an inner layer of resilient foamed material bonded to an outer layer of substantially inelastic flexible sheet and having fastening means for securing said support device tightly about said muscle.

3,926,187

UROLOGICAL BLADDER EVACUATOR

Jose J. Iglesias, 1341 North Ave., Elizabeth, N.J. 07208

Filed Dec. 19, 1974, Ser. No. 534,309
Int. Cl.[2] A61M 1/00
U.S. Cl. 128—232 1 Claim



1. In an evacuator assembly for use in urological operative procedures comprising a syringe and a tube for insertion into the operative field, an improved valve providing communication between the syringe and the tube comprising

a. a fixed hollow cylindrical casing having end walls and a peripheral wall,

b. the cylindrical casing having in its peripheral wall two ports which are positioned at 90° to each other, one of which is adapted to be connected to the tube and the other to a discharge fitting, the latter being downwardly directed in the use of the evacuator assembly to permit discharge into a container, and the cylindrical casing also having a circumferentially extending opening,

c. a cylindrical valve body rotatably mounted within the fixed cylindrical casing and having a passage extending diametrically therethrough positioned to communicate selectively with the two ports in the cylindrical casing,

d. a hollow tubular connecting device forming a one-piece integral connection with the cylindrical valve body and extending outwardly therefrom through the circumferentially extending opening in the cylindrical casing and adapted to be connected to the syringe of the evacuator device,

e. the length of the circumferentially extending opening in the cylindrical body being such that when the connecting device engages one or the other of the end walls of the opening the passage through the valve body registers with one or the other of the ports in the cylindrical casing,

f. the centers of the ports in the valve casing and the axis of the passage in the valve body lying in the same plane which lies between the end walls of the cylindrical casing and is substantially parallel thereto, thereby providing straight line communication between the syringe and the tube and between the syringe and the discharge port.

3,926,188

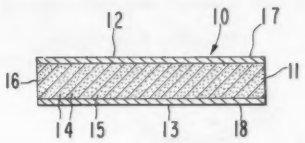
LAMINATED DRUG DISPENSER

Richard W. Baker, Bend, Oreg., and Robert M. Gale, San Jose, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Nov. 14, 1974, Ser. No. 523,720
Int. Cl.[2] A61M 31/00; A61K 27/12
U.S. Cl. 128—260 13 Claims

1. An active agent dispenser comprising a laminate of:

a. a core lamina of particles of a crystalline active agent of low water solubility dispersed in a solid material having a permeability, P, to the agent, the core lamina having a thickness $2t$, and an exposed surface area, A, from which agent is released, and being partially covered by;



b. at least one outer lamina made of an active agent release rate controlling polymer having a permeability, P′, to the agent, a thickness, t', and an exposed surface area, A′, from which agent is released wherein

$$\frac{P}{t} \cdot \frac{t'}{P'},$$

is greater than about 2 and

$$K\left(\frac{A'}{A}\right)^2$$

is at least three times

$$\frac{P}{t} \cdot \frac{t'}{P'},$$

k being a constant whose value is dependent upon the geometrical shape of the laminate.

3,926,189

SELECTIVELY POSITIONABLE DIAPER ASSEMBLY

Glenn N. Taylor, Cary, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

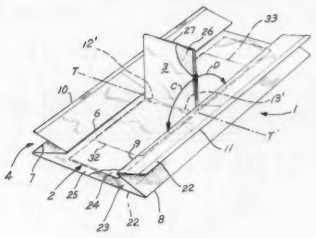
Filed Aug. 5, 1974, Ser. No. 495,027
Int. Cl.[2] A16F 13/16; A41B 13/02
U.S. Cl. 128—287 12 Claims

1. An improved diaper construction comprising in operative combination:

a. a main pad assembly having an absorbent pad and outer fluid impervious backing sheet adapted to be removably secured to an infant,

b. means defining an auxiliary pad assembly movably se-

between a first, frontal position and a second, rear position depending on one or more of the age, sex, activity or



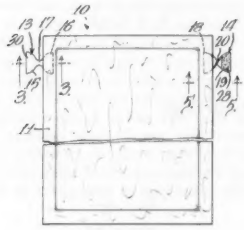
health of the infant, to dispose at the point of need additional absorbent material.

3,926,190

DISPOSABLE DIAPER WITH TWIST TAB FASTENER

Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 20, 1974, Ser. No. 525,536
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—287 **8 Claims**



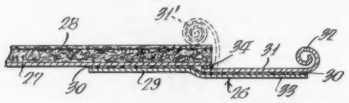
1. In combination with a disposable diaper of substantially quadrilateral configuration, having an inside surface for direction toward an infant when the diaper is worn by that infant and an outside surface for direction away from said infant, and including a thin, flexible backing sheet of substantially moisture-impermeable material defining said outside surface and a moisture-retaining layer having a pad of absorbent material superposed on said backing sheet and attached thereto, a fastening tab means secured to the backing sheet adjacent one end thereof and comprising a pair of relatively wider terminal portions and including a means for adjustably positioning one of said terminal portions to temporarily attach it to the diaper comprising a relatively narrower, twistable and flexible central segment connecting the terminal portions; the other of said terminal portions being fixedly, attached on one side to said backing sheet and having an outwardly-facing release surface, on the other side, said one terminal portion bearing a layer of pressure-sensitive adhesive for attachment to the outside surface of the diaper adjacent a second end thereof when the diaper is applied to the infant and also positionable for removable attachment to said release surface by means of the adhesive layer thereon.

3,926,191

DISPOSABLE DIAPER HAVING ADHESIVE TABS AND RELEASE STRIPS THEREFOR PERMANENTLY ATTACHED AT MARGINAL EDGES OF DIAPER

Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 20, 1974, Ser. No. 525,607
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—287 **4 Claims**



1. In combination with a disposable diaper having an inside surface for direction toward an infant when the diaper is worn by that infant and an outside surface for direction away from said infant and provided with a moisture-retaining layer and a moisture-impervious backing sheet, an improved adhesive tab having a fixed end secured to said backing sheet on the outside surface of the diaper and at a marginal location thereof, and an outwardly extending free end provided with a tacky surface facing in the same direction as said inside surface; and a cover strip provided with a release coating on one surface thereof, releasably attached to, and covering said tacky surface;

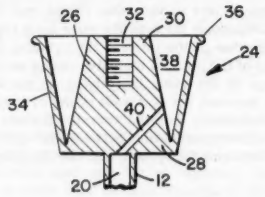
said cover strip extending longitudinally beyond said tacky surface and being permanently attached to said backing sheet at a marginal location thereof.

3,926,192

ATRAUMATIC UTERINE DIRECTOR

Harold B. Van Maren, 1313 Solano Ave., Albany, Calif. 94706

Filed Aug. 12, 1974, Ser. No. 496,843
Int. Cl.[2] A61B *17/42*; **A61M** *1/00*
U.S. Cl. 128—303 R **9 Claims**



1. A device of the character described comprising a member having an end wall, a continuous side wall extending axially outwardly from the periphery of said end wall, an element extending axially from a central portion of said end wall and spaced radially inwardly from said side wall to define a continuous space therebetween, a tip extending axially from said element, a rigid tube connected to said end wall and extending in a contra direction to said side wall, and means defining a passage placing said tube and said continuous space in flow communication.

3,926,193

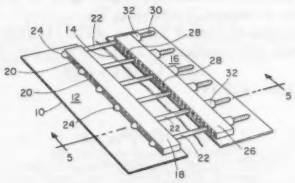
SURGICAL CLOSURE HAVING EASE OF ASSEMBLY

Harrith M. Hasson, 345 Fullerton Parkway, Chicago, Ill. 60614

Continuation-in-part of Ser. No. 209,165, Dec. 17, 1971, which is a continuation-in-part of Ser. No. 123,559, March 12, 1971, Pat. No. 3,698,395. This application July 3, 1974, Ser. No. 485,327

Int. Cl.[2] A61B 17/08

U.S. Cl. 128—335 14 Claims



1. A surgical closure which comprises: a first surgical tape member for application to one side of an incision; a second surgical tape member for application to the other side of an incision; said first surgical tape member being provided with a plurality of tie member anchors and said second surgical tape member having a plurality of tie member receiving slide ports, the improvement comprising, in combination, elongated tie members removably connected to said anchors for coupling to said anchors while a portion of said tie members are received in said slide ports, and separate, tie members locking means removably connected to said tie members, for cooperating with said slide ports to grasp and retain said tie members in desired positions within said slide ports, said locking means comprising sleeve members proportioned to receive said tie members in sliding relationship within the bores of said sleeve members.

3,926,194

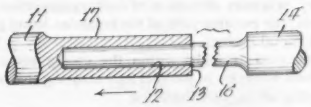
SUTURES WITH REDUCED DIAMETER AT SUTURE TIP

Jonathan Fred Greenberg, New York, N.Y., and Robert T. Quade, Bernardsville, N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Nov. 20, 1974, Ser. No. 525,327

Int. Cl.[2] A61B 17/06

U.S. Cl. 128—339 17 Claims



1. A needle-suture combination comprising a needle having a sharp end and a blunt end and having a recess at said blunt end, a suture having one tip positioned within said recess, means retaining said tip of said suture within said recess to attach said suture to said needle, said tip within said recess and a segment thereof beyond said recess and adjacent the location of the attachment of the suture to said needle being reduced in cross-sectional area and in the amount of cross-sectional suture material as compared to the cross-sectional area and the amount of cross-sectional suture material in the remainder of the suture length.

3,926,195

CLIP, CLAMPING JAW AND ASSEMBLY FOR THE INTERRUPTION OF THE UROGENITAL SYSTEM

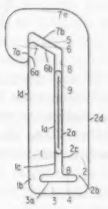
Waldemar Bleier, Saarlouis, and Max Gremmelspacher, Freiburg, both of Germany, assignors to Waldemar Bleier, Germany

Filed Apr. 23, 1973, Ser. No. 353,374

Claims priority, application Germany, Apr. 25, 1972, 2220117

Int. Cl.[2] A61B 17/08, 17/10

U.S. Cl. 128—346 7 Claims



1. An oviduct clip for long term reversible or permanent interruption of the oviduct and vas deferens in human and animal organisms and for retention in said organisms, to be employed with a combined clip-fitting clamp for fitting the clip on the oviduct and vas deferens in a living organism, comprising:

two rigid clamping jaws, one being longer than the other, substantially parallel inside clamping surfaces forming a longitudinal oviduct clamping slop between the jaws in a closed position of the clip, each part having a first and second end, said second end being a free end;

a resilient bridge joining said first ends of said jaws by connecting other portions of the clamping jaws, said bridge forming a transverse slot which communicates and is continuous with the clamping slot, said transverse slot being formed between an inside surface of the resilient bridge and inner first end portions of the clamping jaws; the free second end of said longer clamping jaw having an extending lip, and the free second end of said shorter clamping jaw having a limb, said lip extending around said limb to form a latching mechanism in the closed position of said clip; and

said clip being constructed as a single continuous piece of plastic material which is inert to body fluids and body tissues.

3,926,196

AIRWAY

Walter J. Bornhorst, Acton; Steven J. Coleman, Marlboro, and James W. O'Brien, Waltham, all of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Aug. 5, 1974, Ser. No. 494,651

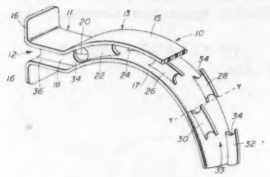
Int. Cl.[2] A61M 25/00

U.S. Cl. 128—351 7 Claims

1. An oral airway for providing both an air passage to a person's trachea and a channel through which to insert a flexible tube into the trachea comprising:

a curved section adapted to fit over a person's tongue and extending to the entrance of the trachea connected to one end of a second section adapted to fit between and support a person's teeth, the other end of said second section being adapted to extend out of a person's mouth to serve as the entrance of said airway, said curved and second sections forming an upper surface and a lower surface, said upper surface being spaced from and connected to

said lower surface by two rows of struts, said two rows of struts together with said upper and lower surfaces defining said channel, said struts in each of said rows being separated from one another to form open passages therebetween, wherein struts in each of said rows define surfaces facing said channel which converge toward the



longitudinal midline of said channel to form tube guides for directing the end of a tube inserted through said entrance toward said midline to thereby guide said tube through said channel and into the trachea, and means mounted on said airway to inhibit inward displacement of said airway.

3,926,197

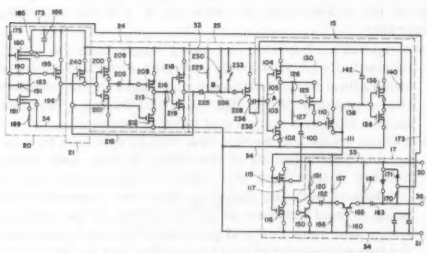
DEMAND HEART PACER

Lawrence Everett Alley, III, North Easton, Mass., assignor to ARCO Medical Products Company, Leechburg, Pa.

Filed Jan. 4, 1974, Ser. No. 430,827

Int. Cl.[2] A61N 1/36

U.S. Cl. 128—419 PT **8 Claims**



1. A heart pacer for producing heart stimulation pulses in the absence of naturally occurring heart pulses, comprising:

a voltage source;

a pair of electrodes, at least one of which is connectable to the heart;

means connected to said electrodes for detecting naturally occurring heart pulses and for generating an inhibiting pulse corresponding to each detected natural heart pulse;

means connected to said voltage source, including a timing capacitor, for generating stimulation pulses for delivery to said electrodes at a constant heartbeat rate independent of the voltage of said voltage source;

means connected to said stimulation pulse generating means for discharging said timing capacitor to inhibit the generation of selected stimulation pulses;

means connected to said detecting means refernced to said voltage source for generating in response to a naturally occurring heart pulse, a waveform having a time varying amplitude directly proportional to the voltage of said voltage source;

means having a threshold activating voltage to which said waveform is applied connected for activating said capacitor discharging means during the time said waveform exceeds the threshold voltage to control the time said timing capacitor is discharged, thereby changing the heartbeat rate of said stimulation pulse generating means directly proportionally to said supply voltage; and,

means for decoupling said waveform to prevent it from activating said stimulation pulse generating means to enable said stimulation pulse generating means to pulse without being inhibited to produce a reference heartbeat rate comparable to the heartbeat rate with said inhibiting means coupled, the difference between said heart beat rates being indicative of the voltage of said voltage source.

3,926,198

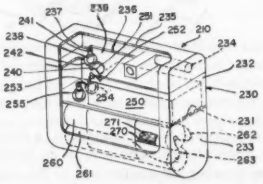
CARDIAC PACER

Steve A. Kolenik, Leechburg, Pa., assignor to ARCO Medical Products Company, Leechburg, Pa.

Continuation-in-part of Ser. No. 477,571, June 10, 1974, abandoned. This application May 2, 1975, Ser. No. 574,199

Int. Cl.[2] A61N 1/36

U.S. Cl. 128—419 PG **3 Claims**



1. A cardiac pacer consisting essentially of the combination of:

a metal casing hermetically sealing the interior zones of the cardiac pacer from exposure to body fluids in the cavity in which the cardiac pacer is implanted, said casing being less than 20 mm thick, and each other orthagonal dimension being less than 60 mm, such small dimensions permitting implantation without troublesome bulging of the skin adjacent the cardiac pacer, said metal casing shielding electrical components from electro-magnetic interference and constituting a grounding electrode for the cardiac pacer;

a hermetically sealed battery chamber and a hermetically sealed circuitry chamber within said casing;

a plurality of batteries in said battery chamber, there being an electrical conductor transmitting battery power from each battery to said circuitry chamber, each battery generating no gas, each battery having a lithium anode and an electrolyte consisting predominantly of thionyl chloride, each battery having prolonged low impedance and constant high voltage of at least 3.3 volts during an expected life of more than 5 years, the voltage diminishing significantly only during the terminal period of use of the battery, whereby detection of battery depletion is manageable, the positive pole of the batteries being grounded to the metal casing;

wires and pass-throughs within the casing associating at least two batteries in parallel and assuring the redundant reliability of parallel batteries;

a circuitry unit employing complementary metal oxide semiconductor circuit means for producing pulses adapted to stimulate the heart, said circuit means being electrically energized by current from said batteries, the casing of the circuit means being grounded to the casing of the heart pacer, said circuit means being within said circuitry chamber, said circuit means including an output wire, said wires and pass-throughs being electrically connected to said circuit means;

said complementary metal oxide semiconductors and said circuit means consuming such a small amount of power that the battery life is more than 5 years;

electrical socket means adapted to transmit to an electrical conduit the output from said circuit means, said electrical

conduit being adapted to transmit the output from said circuit means to a signal-receiving zone of a heart, electrical pass-through means connecting said output wire to said socket means; and

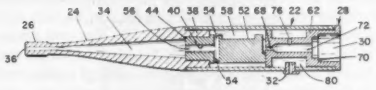
said combination of casing, batteries, wires, pass-throughs, circuit means, and electrical socket means having a weight less than 100 grams and a specific gravity less than 1.7, whereby changes in acceleration or deceleration of a body having such implanted cardiac pacer impart only forces which are tolerable to tissue adjacent the cavity in which the cardiac pacer is implanted.

3,926,199

TOBACCO SMOKE FILTER

Leonard L. Thomas, 375 NW. Cypress, Orange, Calif. 92668

Filed Feb. 12, 1975, Ser. No. 549,335
Int. Cl.² A24F *5/04*
U.S. Cl. 131—187 **16 Claims**



1. In a holder for a cylindrically shaped tobacco smokers' product, the holder having an exit opening at one end and a recess for receiving the end of the tobacco product at its opposite end, the interior walls of which define a passageway for smoke from the recess to the exit opening, the improvement which comprises:

a holder body having means defining a cylindrical cavity;

smoke flow control means in the form of a generally cylindrically having an end face and member having an outer diameter less than the inner diameter of said body and having a region of its outer surface cut away intermediate its ends;

said smoke flow control means being disposed axially within said cavity means for forming, with said body, means providing a substantially annular cavity extending around the inner periphery of said body, a portion the length of which has a greater cross-sectional area than the remainder thereof; and

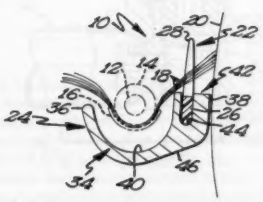
means for introducing smoke into said annular cavity comprising means providing a recess in said end face of said member and a smoke accelerating channel formed by the outer surface of said member and said body and extending from said recess means to said cut away region.

3,926,200

PROTECTION APPARATUS

Luigi G. Losenno, 3804 Thomas Ave. South, Minneapolis, Minn. 55410

Filed Jan. 30, 1974, Ser. No. 545,613
Int. Cl.² A45D *1/18*
U.S. Cl. 132—9 **8 Claims**



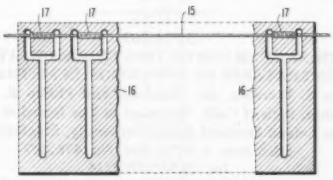
1. Protection apparatus for use with a hair curling iron including a heating element having a circumference and a curling clamp where, during use of the hair curling iron, the hair from the head of a person desiring their hair curled is placed around at least a portion of the circumference of the heating element and is pressed between the heating element and the curling clamp, comprising in combination: a comb member having a length and including a back member having a substantially uniform width through a substantial portion of that length, with the remaining portions of that length having a width equal to or less than the width of the substantial portion, and a multitude of teeth upstanding from the back member; and a guard including a body having a first end, a second end, and of a length which is shorter than the length of the comb by an amount sufficient to allow a portion of the comb to be grasped by the hand of an operator and including a trough member having a first side member, a second side member, and a curved bottom portion therebetween and being of sufficient size to receive the heating element and curling clamp of the hair curling iron therein and to substantially surround the circumference of the heating element to aid in preventing the heating element of the curling iron from contacting the head of the person, the second side member including means for removably receiving the back member of the comb comprising: a U-shaped slot having a width substantially equal to but less than the uniform width of the substantial portion of the back member for receiving the back member of the comb to allow the comb to be positioned in a first position and a second position with a portion of the comb forming a handle member where the handle is formed on the first end of the guard in the first position and where the handle is formed on the second end of the guard in the second position so that the comb can be used to comb the hair, to direct the hair into the trough member of the guard member, and for a handle, and the guard aids in preventing the heating element of the curling iron from coming in contact with the head of the person.

3,926,201

METHOD OF MAKING A DISPOSABLE DENTAL FLOSS TOOTH PICK

Harry Selig Katz, 785 Pleasant Valley Way, W. Orange, N.J. 07052

Filed Nov. 17, 1972, Ser. No. 307,478
Int. Cl.² A61C *15/00*
U.S. Cl. 132—91 **5 Claims**



1. A method of making a disposable dental floss tooth pick having a pair of arms forming a generally U-shaped element, a handle attached to said element and a short-length piece of dental floss strung across the extremities of said arms and embedded therein which comprises the steps of:

providing a plurality of said U-shaped elements having said handle attached thereto with the extremities of said arms generally aligned, stretching an elongated dental floss filament across extremities, embedding said floss into said arms, and cutting the floss at the ends of each of said picks.

3,926,202

COLLAPSIBLE AND TILTABLE UMBRELLA

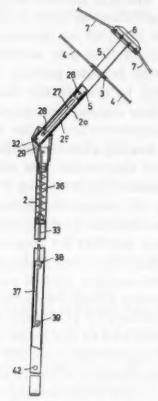
Wolfgang Uthemann, and Josef Hofman, both of Leichlingen, Rhineland, Germany, assignors to Rosenkaimer GmbH, Leichlingen, Rhineland, Germany

Filed Jan. 4, 1974, Ser. No. 430,748

Claims priority, application Germany, Jan. 5, 1973, 2300472

Int. Cl.² A45B 17/00, 19/04, 25/02

U.S. Cl. 135—20 M 10 Claims



1. An umbrella frame comprising a plurality of cover ribs, hinge means for articulately connecting each cover rib to a crown, a crown shaft carrying said crown, a rim, a rim shaft carrying said rim, said crown shaft being mounted for linear sliding motion relative to said rim shaft, a plurality of struts, hinge means for articulately connecting each strut between said cover ribs and said rim, means for imparting sliding movement to said crown shaft whereby the crown and rim are moved away from and toward each other respectively during respective opening and closing operations of said umbrella, said rim shaft including upper and lower shaft sections, and means mounting said upper and lower shaft sections for pivotal movement relative to each other whereby said shaft sections may be disposed either with the axes thereof coincident or oblique relative to each other.

3,926,203

METHOD OF TRANSPORTING CRUDE OIL AT LOW TEMPERATURES BY DISPERSION IN METHANOL

Sullivan S. Marsden, Jr., Stanford, and Phillip R. Hooker, Ventura, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed June 5, 1974, Ser. No. 476,447

Int. Cl.² F17D 1/16

U.S. Cl. 137—13 11 Claims

1. A method of transporting hydrocarbon products through a pipeline from arctic hydrocarbon recovery locations to another location without inducing thawing of the permafrost or other frozen body lying adjacent the pipeline, said method comprising recovering both crude oil as well as natural gases at the arctic locations, converting at least a portion of the recovered gases to methanol, admixing the crude oil with a dispersing medium made up of from about 100 to 65% of the said methanol and about 0 to 35% water in the presence of a surface-active dispersant of such a nature, and present in such amount, as to stabilize the resulting dispersion, said dispersing medium being employed in such proportions as to provide a stable dispersion of the oil-in-methanol type, cooling said dispersion to a temperature below freezing to provide a cold liquid dispersion of good pumpability which does not cause melting of frozen bodies lying adjacent a pipeline when the dispersion is pumped therethrough, and pumping the cold dispersion through a pipeline to the desired location.

3,926,204

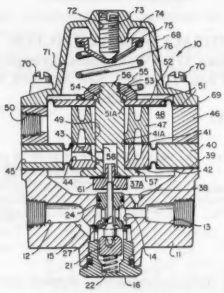
PRESSURE REGULATOR

Webster B. Earl, Pfafftown, N.C., assignor to Fairchild Industries, Inc., Germantown, Md.

Filed May 17, 1974, Ser. No. 470,837

Int. Cl.² G05D 16/06

U.S. Cl. 137—116.5 11 Claims



1. A pressure regulator comprising a body having an inlet and an outlet port, means associated with said body for defining at least a portion of a control chamber, means associated with said control chamber for defining a second chamber including two diaphragms, means for connecting the central portions of said diaphragms including a member having a hole therein, an exhaust valve seat member including a projection and having a valve seat with an aperture extending from the valve seat through said projection for exhausting fluid from said control chamber, the projection of said exhaust valve seat member being laterally moveable within the confines of the hole in the member of said connecting means, the hole of said member being sized to permit free movement of said exhaust valve seat member to compensate for misalignment of said member and said diaphragms, a supply valve including a supply valve seat and a supply valve head located between said ports and means associated with said supply valve head for engaging the valve seat of said exhaust valve seat member.

3,926,205

QUICK COUPLING CONNECTORS

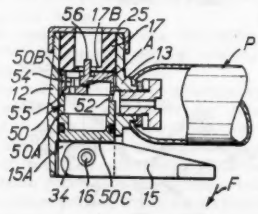
Gaston Gourlet, Vaucresson, France, assignor to Etablissements Boutrait-Morin, Aubervilliers, France

Filed Apr. 9, 1973, Ser. No. 349,311

Claims priority, application France, Apr. 11, 1972, 72.12586

Int. Cl.² F16K 15/20

U.S. Cl. 137—223 11 Claims



1. A quick-coupling connector adapted to be temporarily coupled to an inflation valve of an air chamber or tire while being in communication with a source of fluid under pressure, said connector comprising a tubular body, an elastically deformable sealing ring disposed in said tubular body adjacent

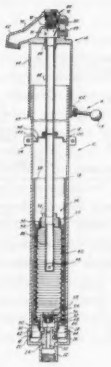
one end thereof for receiving an inflation valve body, piston actuator means mounted for axial displacement in said tubular body, an operatino, member carried by said tubular body for displacing said piston actuator means, said piston actuator means being arranged between said sealing ring and said operating member for movement by said operating member to compress said sealing ring, said operating member having a coupling position for exerting a compressive force on said sealing ring temporarily deforming said sealing ring in order to assure fluid-tightness between said connector and an inflation valve body positioned within said sealing ring, said operating member also having a rest or uncoupled position wherein said sealing ring is uncompressed, said tubular body having an air flow orifice therethrough and connecting means for connecting said tubular body air flow orifice to the source of fluid under pressure, said connecting means being in the form of a tubular radial extension integrally formed on said tubular body in communication with said tubular body air flow orifice, said piston actuator means having an air passage therein in communication with said sealing ring and an air flow orifice between said air passage and the exterior of said piston actuator means into said tubular body, said piston actuator means air flow orifice being in communication with said tubular body air flow orifice for directing fluid under pressure to said sealing ring, and check valve means disposed in the path of fluid flow between the source of fluid under pressure and said sealing ring for preventing return flow of fluid under pressure from inflation valve to the source of fluid under pressure.

3,926,206

YARD HYDRANT

Noel M. Anderson, Storm Lake, and Arlin W. Otto, Lakeside, both of Iowa, assignors to Merrill Manufacturing Company, Inc., Storm Lake, Iowa

Filed Sept. 18, 1974, Ser. No. 506,956
Int. Cl.[2] E03B *9/04*
U.S. Cl. 137—281 **6 Claims**



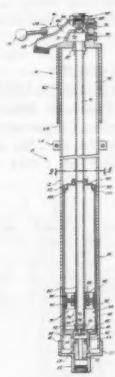
1. A yard hydrant, comprising:
a casing having an upper and lower end,
a valve housing with a spring loaded valve means therein in the lower end of said casing and operatively connected to a source of fluid under pressure,
a head section including an integral nozzle,
means for arranging said head section relative to the upper end of said casing for vertical reciprocation relative thereto,
a longitudinal expandable and retractible bellows fluid reservoir having an upper and lower end arranged within said casing,
a standpipe within said casing having one end secured to said head section in flow communication therewith and its other end extended through the upper end of said reservoir and terminating within said reservoir,
said standpipe being vertically reciprocal with corresponding movement of said head section,
a respective integral axial projecting lower neck portion and upper neck portion at the respective lower and upper ends of said bellows reservoir,
said upper neck portion embracing said standpipe and said lower neck portion embracing said valve housing,
a first stop member embracing said lower neck portion and said valve housing and in abutment with the lower end of said bellows reservoir including means for locking said stop member in said position,
a second stop member embracing said upper neck portion and said standpipe and in abutment with the upper end of said bellows reservoir including means for locking said stop member in said position,
the downwardly movement of said standpipe effecting the retraction and compression of said reservoir and with said other end of said standpipe acting against said valve means to open fluid flow through said hydrant, and
the upwardly movement of said standpipe elevating the same from contact with said valve means permitting it to close and simultaneously expanding said reservoir whereby fluid in said standpipe upon closing of said valve means drains therefrom into said reservoir for storage.

3,926,207

YARD HYDRANT

Noel M. Anderson, Storm Lake, and Arlin W. Otto, Lakeside, both of Iowa, assignors to Merrill Manufacturing Company, Inc., Storm Lake, Iowa

Continuation-in-part of Ser. No. 506,956, Sept. 18, 1974. This application Nov. 5, 1974, Ser. No. 520,978
Int. Cl.[2] E03B *9/04*
U.S. Cl. 137—281 **4 Claims**



1. A yard hydrant, comprising:
a casing having an upper and lower end,
a valve housing with a spring loaded valve means therein in fluid seal contact with the lower end of said casing,
a fitting means secured to the lower end of said casing and adapted for flow communication with the source of fluid under pressure,
said fitting means having an orifice plug with an externally threaded neck extended into the lower end of said casing, said valve housing being removably threadably attached to said threaded neck,

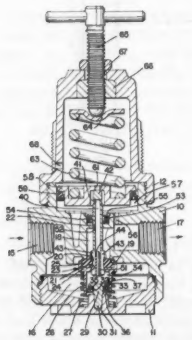
a head section including an integral nozzle,
means for arranging said head section relative to the upper end of said casing for vertical reciprocation and rotation relative thereto,
a standpipe within said casing having one end secured to said head section in flow communication therewith and being vertically reciprocal with corresponding movement of said head section,
a cylinder having an upper and lower end and arranged in the lower end of said casing,
means for securing the lower end of said cylinder in fluid seal contact with said valve housing,
said other end of said standpipe being disposed axially within said cylinder and vertically reciprocal relative thereto,
fluid seal means on said standpipe being operable relative to said cylinder whereby a fluid reservoir is defined at the bottom by said valve housing, at the top by said fluid seal means and for the reservoir wall component by said cylinder,
the downwardly movement of said standpipe and fluid seal means thereon effecting the reduction in size of said reservoir and with said other end of said standpipe acting against said valve means to open fluid flow through said hydrant,
the upwardly movement of said standpipe and fluid seal means thereon elevating said standpipe from contact with said valve means permitting it to close and simultaneously enlarging said reservoir whereby fluid in said standpipe upon closing of said valve means drains therefrom into said reservoir for storage,
the upper end of said cylinder being provided with a notch, and
a lug key secured to said standpipe at a point thereon whereby in a downwardly movement of said standpipe said lug key is engaged in said notch so that an assembly comprising said head section, standpipe, cylinder and valve housing with valve means can be manually rotated to remove said valve housing from said fitting means to permit withdrawal from said casing as a unit said assembly for purposes of repair or maintenance.

3,926,208

PRESSURE REGULATOR

Robert Kendall Hoffman, Plainwell, Mich., and 137, 116.5, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed June 20, 1974, Ser. No. 481,152
Int. Cl.[2] F16K *17/34*
U.S. Cl. 137—484.8 **13 Claims**



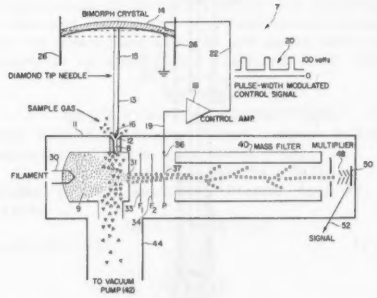
1. In a fluid pressure regulator having a housing with a main passage therethrough that includes passage portions upstream and downstream of a valve seat, a valve element on the upstream side of the seat and having a head at one end thereof movable into and out of engagement with the seat for controlling flow through the passage, said valve element having a first area subject to downstream fluid pressure acting to unseat the valve element, a control chamber in the housing, a piston having one side thereof forming a movable wall of the control chamber, a spring on the other side of the piston pressing the piston toward the valve element, a stem connecting the valve element and the piston, and a first aspirating passage connecting the control chamber to the downstream passage portion; the improvement comprising a cylindrical skirt extending from the valve head into the upstream passage portion and being open at its end remote from the valve head, a packing slidably and sealingly engaging the inner wall of the skirt to form a balancing chamber within the skirt that is sealed from said upstream passage portion by said packing, said packing with the skirt defining an area on said valve element substantially the same as and opposite said first area, and a second passage connecting the balancing chamber to said downstream passage portion whereby fluid pressures acting on opposite sides of the valve element are substantially balanced, said housing includes a cap removably connected to the remainder of the housing and carrying said packing whereby upon separation of the cap from the remainder of the housing the packing is also removed from the remainder of the housing with the cap and is readily accessible for replacement.

3,926,209

METHOD AND INLET CONTROL SYSTEM FOR CONTROLLING A GAS FLOW SAMPLE TO AN EVACUATED CHAMBER

Ingvar E. Sodal; Lars Hoivik, both of Boulder; Alexander J. Micco; John V. Weil, both of Denver, and Norman W. Baer, Boulder, all of Colo., assignors to Regents of the University of Colorado, Boulder, Colo.

Division of Ser. No. 355,792, April 30, 1973, Pat. No. 3,895,231. This application Sept. 23, 1974, Ser. No. 508,452
Int. Cl.[2] F16K *31/02*
U.S. Cl. 137—487.5 **8 Claims**



1. A servo-controlled inlet system for an evacuated chamber, said system comprising: an inlet passage opening into the interior of an evacuated chamber and through which gas may be introduced into said chamber; valve means at said inlet passage for controlling the effective opening through which gas may be introduced into said passage; valve positioning means connected with said valve means to position the same; sensing means for sensing the pressure within said evacuated chamber and developing an electrical signal indicative thereof; and signal processing means including control amplifier means for receiving said signal from said sensing means and responsive thereto producing a pulse-width modulated control signal that is coupled to said valve positioning means to control the same whereby said valve means is automatically adjusted in position dependent upon sensed pressure.

3,926,210

VALVE COMBINATION FOR HYDRAULIC SYSTEMS

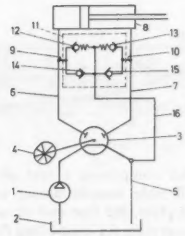
Ivar Rasmussen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

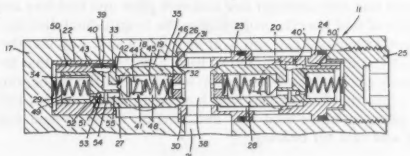
Filed Apr. 12, 1974, Ser. No. 460,278

Claims priority, application Germany, Apr. 14, 1973, 2318962

Int. Cl.² F15B 21/00

U.S. Cl. 137—491 2 Claims





1. A valve assembly for hydraulic installations which is connectable between two different pressures in first and second regions and which opens when the pressure in a first chamber connected to said first region exceeds the pressure in a second chamber connected to said second region by a predetermined amount or falls below the pressure in said second region by a smaller amount, comprising, a casing, a valve member axially movable in said casing, a valve seat, said valve member having a face engageable with said seat, resilient means biasing said valve member towards said seat, said first and second pressure regions and chambers being upstream and downstream respectively relative to said valve seat, said valve member having pressure faces in both of said chambers for biasing said valve member in an opening direction, said valve member and casing forming third and fourth chambers, said valve member having third and fourth pressure faces in said third and fourth chambers for biasing said valve member in a closing direction, fluid communication between said first and third chambers with restrictor means disposed therebetween, fluid communication between said first and fourth chambers with restrictor means disposed therebetween, spring loaded valve means between said third and second chambers, and one way valve means between said fourth and second chambers.

3,926,211

FLUID FLOW CONTROL VALVE

Bernard Graham MacLarty, Bedfordview, South Africa, assignor to Phoenix Valve Manufacturers Limited, Durban, South Africa

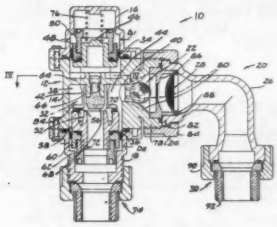
Filed May 6, 1974, Ser. No. 467,100

Claims priority, application South Africa, May 8, 1973, 73/3118

Int. Cl.² F16K 31/365, 31/385

U.S. Cl. 137—494 10 Claims

1. A fluid flow control valve comprising a casing, an inlet leading into said casing, a movable valve element in said casing, first and second means sealing between said element and said casing, such means being spaced apart in the direction in which said element is capable of movement and, together with said casing and said element, bounding a pressure chamber into which said inlet leads, the valve element having a hollow interior and there being an outlet from said hollow interior of the valve element which outlet reduces the area of the movable element on which inlet pressure acts in one direction and which opens into an outlet path leading to the exterior of the valve, said pressure chamber communicating with said outlet path by way of said outlet and said hollow interior, a valve closure member for closing-off said outlet, and said



element having a position in which said member closes said outlet to prevent flow from said hollow interior to said outlet path and being capable of movement from said position to establish communication between said hollow interior and said outlet path thereby to open the valve, and the area of one end wall of said chamber, over which area inlet pressure is effective, being different to the area of the other end wall of said chamber over which inlet pressure is effective, and the difference providing a differential area subjected to inlet pressure which compensates for the reduction in inlet pressure subjected area arising from the provision of said outlet.

3,926,212

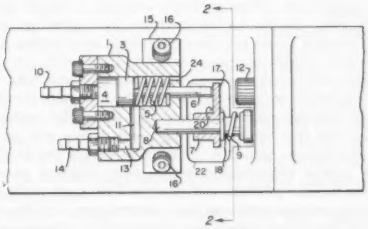
SIGNAL VALVE

Paul K. Bizilia, Sayre, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jan. 16, 1975, Ser. No. 541,520

Int. Cl.² F16K 37/00

U.S. Cl. 137—495 10 Claims



1. A signal valve for determining the initiation of movement of a part comprising:

a valve body having a central bore;

a pressure fluid inlet entering said bore;

a pressure fluid outlet from said bore;

a piston member disposed in said bore for displacement from a first position close to said inlet to a second position close to said outlet, to a third position beyond said outlet; said piston being disposed between said inlet and outlet in both the first and second positions to seal the pressure fluid from the outlet;

intercept means to prevent said piston from displacement beyond the second position once pressure fluid is applied to said inlet;

displacement means operable only after said piston is in said second position and in response to a motion to be sensed to displace said intercept means and allow said piston to move to said third position; and signal means responsive to said piston moving to said third position.

3,926,213

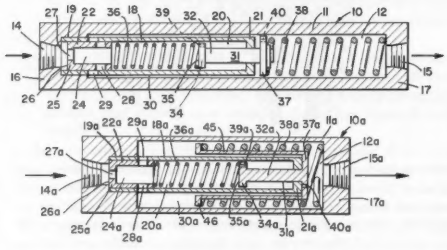
FLOW CONTROL DEVICE

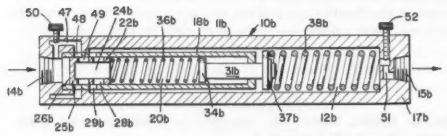
Victor H. Carder, 505 Sausalito Blvd., Sausalito, Calif. 94965

Filed Dec. 20, 1973, Ser. No. 426,941

Int. Cl.² G05D 7/01

U.S. Cl. 137—504 **12 Claims**





1. A flow control device operative to change the volumetric flow of a fluid therethrough in inverse relation to changes from a predetermined norm in the supply pressure of such fluid, comprising: casing structure defining an axially extending chamber therein having both an inlet opening and an outlet opening communicating therewith, and further having a flow control port interposed in a flow path relationship with said inlet and outlet openings and communicable with each; flow adjustment means interposed in the flow path intermediate said chamber and each of said inlet and outlet openings to regulate the flow of fluid through said device and pressure drop thereacross; said flow adjustment means comprising: a piston axially reciprocable within said chamber generally between normal-pressure and abnormal-pressure positions in traversing relation with said flow control port, and having an end wall providing surface areas disposed in pressure-receiving relation with said inlet opening to have a pressure force developed thereagainst; a spring seat structure axially reciprocable within said chamber generally between normal-pressure and abnormal-pressure positions and having a pressurizable surface spaced from said piston and forming a pressurizable space therewith communicable with said inlet opening and being disposed in facing relation with said piston to enable a pressure force to develop therebetween urging the piston and seat structure in opposite axial directions; spring structure biasing said seat structure toward the normal-pressure position thereof; and spring means operative between said seat structure and piston to bias the latter toward the normal-pressure position thereof.

3,926,214

LAMELLA VALVE FOR PISTON COMPRESSORS

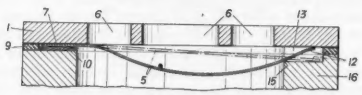
Hans Hrabal, Vienna, Austria, assignor to Hoerbiger Ventilwerke Aktiengesellschaft, Vienna, Austria

Filed June 12, 1974, Ser. No. 478,731

Claims priority, application Austria, June 28, 1973, 5680/73

Int. Cl.² F16K 15/16

U.S. Cl. 137—525.3 **3 Claims**



1. A lamella valve comprising a seat plate formed with passage means, a flexible lamella having one end portion clamped on the seat plate, the free end of said lamella being movable from said seat plate for controlling fluid flow through said passage means, a stop member for said free end portion of said lamella spaced from said seat plate, a gap formed beween said stop member and said seat plate and said free end portion of said lamella projecting in the longitudinal direction thereof within said gap and over an edge of said stop member whereby said edge is adapted to form a tilt bearing so that the projecting end of said lamella can swivel about the tilt bearing and cause the free end of said lamella to strike against said seat plate to brace said free end portion between said seat plate and said tilt bearing.

3,926,215

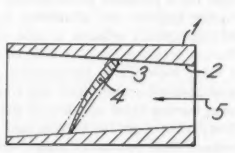
FLUID CONTROL VALVES

Norman Macleod, Edinburgh, Scotland, assignor to National Research Development Corporation, London, England

Filed Aug. 3, 1973, Ser. No. 385,337

Int. Cl.² F16K 15/03

U.S. Cl. 137—527.8 **6 Claims**

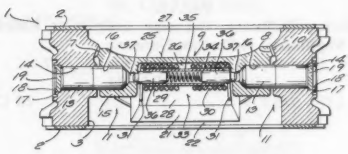


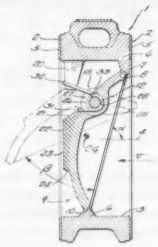
1. A fluid control valve comprising a smooth annular seat member defining a fluid flow passageway therethrough, and a disc shaped in plan view to correspond with the radially inner portion of a transverse section of said seat member for movement about an axis through the seat member and disc to and from a position in which the disc closes said passageway, said axis defining smaller and larger disc portions on opposite sides thereof wherein the mass of said disc is substantially balanced about said pivotal axis, said disc having a non-symmetrical aerofoil cross-sectional shaping in a direction perpendicular to said axis to define leading and trailing edges respectively located in said smaller and larger disc portions, said aerofoil shaping of said disc including a concave surface on one side of said disc and a convex surface on the other side thereof, and said shaping defining respective centers of pressure which are both located in said larger portion of said disc in respect to fluid flow in opposite directions through said shaping, said shaping rendering said disc self-stabilized in its open position.

3,926,216
ARRANGEMENT OF CHECK VALVES

Carl-Edvard Jan Rülcker, Linkoping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed June 6, 1974, Ser. No. 477,149
Claims priority, application Sweden, June 8, 1973, 7308107
Int. Cl.² F16K 15/03
U.S. Cl. 137—527.8 15 Claims





1. A damper-type check valve of the type comprising a valve body that defines a passage through which fluid is intended to flow in a forward axial direction and around which passage there is an annular valve seat, and a damper in said body having a peripheral surface that is sealingly engageable with the seat in a closed position of the damper, said damper being swingable to and from said closed position about a pivot axis that extends parallel to the plane of said valve seat, is spaced in the forward direction from said plane and is spaced above the axis of the passage when the valve is oriented with said axes horizontal, said damper being biased by gravity towards its closed position and being urged away from its closed position by the force of fluid flowing in said forward direction, said check valve being characterized by:

A. the pivot axis about which the damper swings being spaced above the axis of the passage by a distance substantially less than the radius of the valve seat; and

B. the damper having a counterweight which comprises a projection on its forward face and which is wholly located in a zone near the passage axis and is substantially centered on that axis so that the center of gravity of the damper is near the geometrical center thereof and a substantial part of its mass is at a comparatively small distance from the pivot axis, to provide the damper with a small radius of gyration that assures fast movement of it to its closed position when the velocity of fluid flow in the forward direction diminishes rapidly.

3,926,217
FLUID LOGIC PROGRAMMER

Masateru Ohishi, Kobe, Japan, assignor to Konan Electric Company, Ltd., Japan

Filed Aug. 13, 1973, Ser. No. 387,695
Int. Cl.² F16K 11/00
U.S. Cl. 137—596.18 6 Claims

1. A fluid logic valve assembly comprising in combinations:

A. a first valve section comprising:

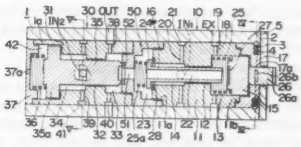
a first cylindrical block having first and second ends and an axial opening extending in alignment with the longitudinal axis of said first block, said axial opening being, at said first and second ends, enlarged in different diameters thereby forming first and second fluid chambers;

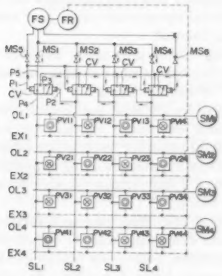
a third fluid chamber in axial alignment and communication with said second fluid chamber;

a plunger housed within said first fluid chamber;

said first fluid chamber with said plunger housed therein being confined by a first closure member connected to said first end of said first cylindrical block;

said first fluid chamber being communicated without said first block through a plurality of first passages formed in said first cylindrical block and extending radially





outwardly from said first fluid chamber, with outer openings of said plurality of said first passages being communicated with each other by a first annular groove formed around said first cylindrical block;

said second chamber being communicated without said first block through a plurality of second passages formed in said cylindrical block and extending radially outwardly from said second fluid chamber, with outer openings of said plurality of said second passages being communicated with each other by a second annular groove formed around said first cylindrical block;

a hollow valving rod slidably and fluid tightly extending through said axial opening and having a first end situated within said first fluid chamber and a portion adjacent a second end thereof situated within said second fluid chamber;

said hollow valving rod having a third fluid passage formed therein in alignment with a longitudinal axis thereof, said third passage having a first end open towards said first fluid chamber and a second end open towards said third fluid chamber;

said second end of said hollow valving rod adjacent to said second end of said third fluid passage being formed with a radially outward flange forming a valving member means for selectively opening and closing communications between said second and third fluid chambers;

a first spring means positioned in said first fluid chamber for biasing said plunger toward said first end of said first block into a first position with said plunger abutting said first closure member;

a second spring means positioned in said third fluid chamber for biasing said hollow valving rod toward said first end of said first block into a first position with said flange of said hollow valving rod aubtting said second end of said first block and closing communication between said second and third fluid chambers;

there being a space between said first end of said hollow rod and said plunger when said hollow valving rod and said plunger are in said respective first positions; and

an actuating member, having a first end rigidly connected with said plunger and a second end situated outside said first closure member, slidably extending through a through hole formed in said first closure member in alignment with said longitudinal axis of said first cylindrical block;

said actuating member being reciprocable along said longitudinal axis of said first block to cause said plunger to close communication between said third and first fluid chambers and open communication between said second and third fluid chambers;

B. a second valve section comprising:

a second cylindrical block having first and second ends and an axial opening extending in alignment with a longitudinal axis of said second block, said axial opening being, at said first and second ends, enlarged in different diameters to form fourth and fifth fluid chambers;

a piston slidably extending through said axial opening in said second cylindrical block and having a land on a first end thereof;

third spring means interposed between said land and a second closure member closing said second end of said second cylindrical block;

a plurality of fourth fluid passages formed in said second block and extending radially outwardly from said fourth fluid chamber, with outer openings of said plurality of fourth passages being communicated with each other by a third annular groove formed around said second block;

a plurality of fifth fluid passages formed in said second block and extending radially outwardly from said fifth fluid chamber, with outer openings of said plurality of fifth passages being communicated with each other by a fourth annular groove formed around said second block; and

said second closure member and said piston forming a space therebetween within which space said third spring means is housed and which space is communicated with atmosphere through a hole formed in said second closure member and is of a sufficient size to permit said piston to move between first and second positions, said piston being normally biased in one direction by the action of said third spring means to said first position whereat said land of said piston is spaced farthest away from said second closure member;

said piston being actuatable by fluid pressure in said fifth fluid passages to said second position whereat said land of said piston is adjacent said second closure member;

C. coupler means for fixedly connecting said first end of said second block and said second end of said first block and separating said third and fourth fluid chambers, said coupler means and said second end of said first block defining therebetween said third fluid chamber, said coupler means having extending therethrough a sixth passage communicating said third and fourth fluid chambers and in axial alignment with the longitudinal axis of at least one of said hollow valving rod and said piston, a second end of said piston when said piston is in said first position abutting said coupler means and closing said sixth passage, said second end of said piston being spaced from said coupler means when said piston is in said second position, thus allowing communication between said third and fourth fluid chambers via said sixth passage; and

D. a single housing having a cylindrical opening therethrough; said first and second blocks connected by said coupler means being positioned in said cylindrical opening; separate first, second, third and fourth port means extending through said housing for respectively providing fluid communication with said first, second, third and fourth annular grooves.

3,926,218

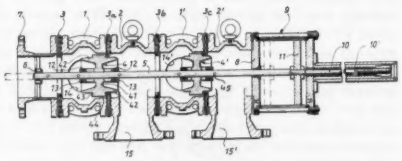
VALVE

Horst Weller, Heilbronn, Germany, assignor to Cillichemie Ernst Vogelmann, Heilbronn, Germany

Filed Sept. 13, 1974, Ser. No. 505,647

Int. Cl.[2] F16K *11/04*

U.S. Cl. 137—625.27 **10 Claims**



1. A valve comprising:

a. a casing having a plurality of sections juxtaposed in a row,

1. each section defining a cavity therein and being formed with two ports aligned in the direction of said row with the ports of the other sections;

b. a valve seat member interposed between each pair of juxtaposed sections and formed with an aperture aligned with said ports in said direction, whereby two valve seat members are associated with each of said sections;

c. a drive member passing through the aligned ports and apertures;

d. two valve disc members mounted on said drive member in the cavities of respective sections for movement with said drive member between respective first and second positions,

1. each valve disc member in said first position thereof sealingly engaging one valve seat member associated with the cavity receiving said valve disc member, said valve disc member in said second position sealingly engaging the other valve seat member associated with said receiving cavity,

2. said valve disc member having a cross section transverse to said direction greater than the cross sections of the apertures in said one valve seat member and in said other valve seat member;

e. two throttling members oppositely projecting from said valve disc member in said direction,

1. one throttling member being received in the aperture of said one valve seat member when said valve disc member is in said first position thereof, and the other throttling member being received in the aperture of said other valve seat member when said valve disc member is in said second position thereof,

2. the cross section of each throttling member transverse to said direction being smaller than the cross section of the receiving aperture, whereby said throttling members and the associated valve seat members define gaps therebetween when said valve disc members approach said first and second positions thereof,

3. the dimensions of said gaps respectively defined by the throttling members on one of said valve disc members with the associated valve seat members differing from the dimensions of the gaps simultaneously defined by the throttling members mounted on the other valve disc member with the associated valve seat members.

3,926,219
INJECTION NOZZLE FOR FOAMING MACHINES

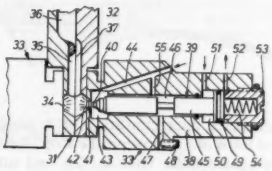
Heinrich Ersfeld; Klaus Nadolski, both of Bergisch-Neukirchen; Walter Schneider, Bensberg, Immenkaeppel; Klaus Schulte, Leverkusen, and Heinrich Boden, Opladen, Luetzenkirchen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 19, 1974, Ser. No. 534,318

Claims priority, application Germany, Dec. 24, 1973, 2364501

Int. Cl.² F16K *11/07*

U.S. Cl. 137—625.49 **3 Claims**



1. An injection nozzle for injecting reactants into the mixing chamber of a foam machine mixing head which comprises

a housing having a longitudinal bore adapted to receive a nozzle needle, a nozzle opening located in a traverse wall which terminates one end of said bore, a first traverse bore entering the longitudinal wall of the longitudinal bore at a point adjacent to said nozzle opening, a second traverse bore entering said longitudinal wall at a point remote from the point of entry of said first traverse bore and an annular groove immediately adjacent to said traverse wall; and

a nozzle needle slidingly disposed within said longitudinal bore of the housing and having one end adapted to sealingly engage said nozzle opening and the other end coupled to a positive control means for moving said needle a preset longitudinal distance into or out of engagement with said nozzle opening;

said nozzle needle being provided with an annular groove so positioned that when the nozzle needle is in sealing engagement with the nozzle opening the annular groove provides communication between said first traverse and said second traverse bores and when said nozzle needle is moved its preset distance out of engagement they provide no communication between said traverse bores.

3,926,220
MIXER FOR HOT AND COLD LIQUIDS

Francois-Regis Mahrer, Geneva, Switzerland, assignor to Kugler Fonderie et Robinetterie S.A., Geneva, Switzerland

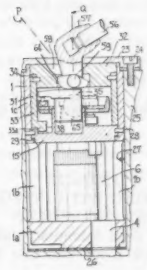
Filed Dec. 9, 1974, Ser. No. 530,716

Claims priority, application Switzerland, Dec. 11, 1973, 17346/73; Nov. 20, 1974, 15413/74

Int. Cl.² F16K *19/00*

U.S. Cl. 137—636.1 **10 Claims**

1. A mixer for hot and cold liquids, comprising housing means providing a mixing chamber, first and second liquid supply ducts leading to the mixing chamber and a mixture discharge duct leading from the mixing chamber, the mixer including first and second valves in said first and second liquid supply ducts, first and second operating members for said first and second valves respectively, means mounting said operating members for movement in said housing means in a first direction, means coupling said valves with their respective operating members whereby the flow cross-section of the respective supply duct through the respective valve is variable by movement of the respective operating member in said first direction, a control element, and means mounting said control element for rotation with respect to said housing means about a first axis extending in said first direction, a variable - inclination actuating element, means mounting said actuating element for pivoting about a second axis perpendicular to, and intersecting, the axis of said control element and fixed with respect to said control element, an adjustable abutment acting on said actuating element at a position offset from said first axis, means mounting said adjustable abutment for movement in said first direction only with respect to said casing means for varying the inclination of said actuating element about said second axis, said operating members acting on said actuating element at positions offset from each other, from said position of said adjustable abutment and from said first axis, said positions at which said operating members and said adjustable



abutment act on said actuating element together defining a plane the intersection of which with said first axis is substantially equidistant from said positions at which said operating members act on said actuating element, and the position at which said adjustable abutments acts on said actuating element lying substantially on the bisector of the angle subtended at said point of intersection by the positions at which said operating members act on the actuating element, the dispositions of said positions with respect to said first axis and with respect to each other being such that over a range of possible settings of the mixer the ratio

$$\frac{R3}{(R1 + R2)}$$

is substantially constant, where R1, R2 and R3 denote the perpendicular distance from said second axis to the positions at which said first operating member, said second operating member, and said adjustable abutment respectively act on actuating element, whereby the proportions of fluid from said first and second supply ducts in the mixture issuing from the mixture discharge duct is substantially determined by the angular position of said control element about said first axis, while the total mixture delivery is substantially determined by the position, in said first direction, of said adjustable abutment.

3,926,221
LAMINAR FLUIDIC MULTIPLIER

Robert L. Woods, Kensington, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 14, 1974, Ser. No. 497,412

Int. Cl.² F15C *1/14*

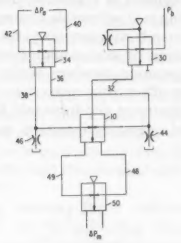
U.S. Cl. 137—819 **2 Claims**

1. A fluidic multiplier circuit, which comprises:

a proportional fluidic amplifier operated in the laminar region having a supply pressure input and a pair of signal inputs and a pair of outputs;

a biased fluid amplifier having a supply pressure, an output and a single-sided transfer characteristic, said output connected to said supply pressure input of said proportional fluidic amplifier; and

a preconditioning fluid amplifier having a supply pressure equal to that of said biased fluid amplifier and an output

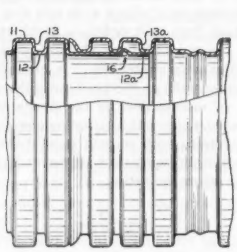


connected to said pair of signal inputs of said proportional fluidic amplifier.

3,926,222
CORRUGATED TUBING WITH INTEGRAL COUPLING MEANS THEREON

Robert E. Shroy, and John Schmunk, both of Findlay, Ohio, assignors to Hancock Brick and Tile Company, Findlay, Ohio

Filed Dec. 18, 1973, Ser. No. 425,878
Int. Cl. F16l *21/00, 37/00, 41/00*
U.S. Cl. 138—122 **8 Claims**



1. An indeterminate length of thermoplastic tubing comprised of:

at least two corrugated sections of tubing having corrugations upon the inner and outer surfaces thereof defined by roots and crests joined by walls;

said two sections being joined by a unitary coupling blank having a male portion integral with one section and a female portion integral with the other section; said male portion being essentially smooth walled and uncorrugated and having a plurality of radially outwardly projecting cleats thereon;

said female portion having corrugated inner and outer surfaces with the crests thereof being essentially of the same outer diameter as the crests of said at least two corrugated sections of tubing;

the roots of the corrugations of the female portion defining an inner diameter which is greater than the outer diameter of the said male portion and also greater than the inner diameter of the said at least two sections;

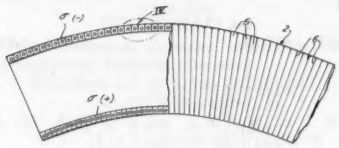
said radially projecting cleats defining a diameter greater than the inner diameter and less than the outer diameter of the corrugations of the female portion; whereby upon severing the male and female portions,

the female portion will telescopically receive the male portion and the cleats will lockingly engage the corrugations thereof to thereby connect said at least two corrugated sections.

3,926,223
LARGE DIAMETER HOLLOW BODIES OF HELICAL THERMOPLASTIC STRIP

Aristovoulos George Petzetakis, Thessaloniki & Chandri Street, Moschaton, Piraeus, Greece

Filed June 19, 1973, Ser. No. 371,558
Claims priority, application Greece, June 21, 1972, 48609
Int. Cl.² F16L *11/12*
U.S. Cl. 138—129 **3 Claims**

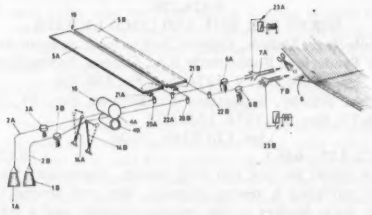


1. A large-diameter duct consisting of a multiplicity of generally helical turns of a hollow-profile strip, the strip being of substantially square outer cross-section and substantially circular internal cross-section, said strip having a pair of lateral parallel flank walls and a pair of free walls between said flanks, the flank walls of adjoining turns being butt-welded together whereby said free walls define inner and outer surfaces of the duct, said strip being composed of polyvinylchloride or polyethylene thermoplastic synthetic-resin material enabling elastic deformation of said free walls upon bending of said duct and relaxation of the deformation stresses in said free walls with time, said strip having a minimum wall thickness at said lateral flanks which is approximately 50% of the minimum wall thickness at said free walls, each pair of adjoining turns defining accumulations of thermoplastic material of V-section at the butt-weld between them.

3,926,224
WEFT SELECTING, MEASURING AND STORING APPARATUS

Geert Jan Vermeulen, and Adrianus Henricus Van Duynhoven, both of Deurne, Netherlands, assignors to Ruti-Te Strake B.V., Deurne, Netherlands

Filed Oct. 10, 1974, Ser. No. 513,645
Claims priority, application Netherlands, Oct. 11, 1973, 7314025
Int. Cl.² D03D *47/36*
U.S. Cl. 139—122 H **1 Claim**

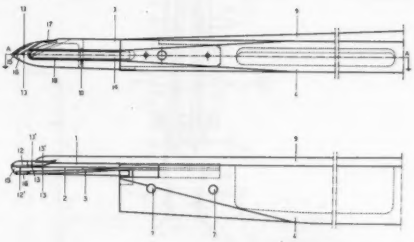


1. In a weaving machine, apparatus for selectively feeding a weft yarn, comprising a pair of continuously driven rollers, one of which has at least one peripheral groove with diverging side walls, and the other of which has a similar peripheral groove, said rollers engaging to form a nip in which said grooves register to form an opening between the rollers, a thread guide which is movably mounted for movement between a position in which it is in alignment with said opening, so as to maintain a weft yarn in said opening, and a position in which it guides said weft yarn into driven engagement in the nip of the rollers at one side of said opening, and means for selectively moving said thread guide between said positions.

3,926,225
GRIPPER POINT FOR LOOM PROJECTILES WITH AN EXTERNAL FEED

Jacques Palencher, Troyes, France, assignor to Lebocey Industrie, Troyes, France

Filed Dec. 26, 1973, Ser. No. 428,518
Claims priority, application France, Feb. 20, 1973, 73.05975
Int. Cl.² D03J 5/06
U.S. Cl. 139—125 8 Claims

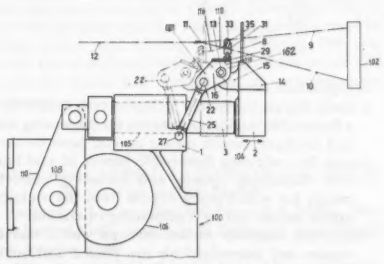


1. A gripper point for loom projectiles with an external feed, comprising a plate, a rocker strip and a spring blade, said rocker strip pivoting about an axis parallel to said plate and supported by said plate, said spring blade bearing resiliently on said rocker strip near one end thereof in order to press said rocker strip against said plate, said plate and said rocker strip having in the area in which they are pressed against one another surfaces for gripping a weft thread, and said plate being provided with a hook for guiding a weft thread toward the gripping surfaces.

3,926,226
GUIDE MEMBER SUPPORT AND DEVICE FOR BEATING UP WEFT YARN IN THE SHED OF A LOOM

Allan William Henry Porter, Lustmuhle, Switzerland, assignor to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Apr. 1, 1974, Ser. No. 456,808
Claims priority, application Switzerland, Apr. 10, 1973, 5111/73
Int. Cl.² D03D 49/60
U.S. Cl. 139—190 16 Claims



1. Device for guiding the picking of weft yarn and for beating up weft yarn in the shed of a loom, comprising:

a loom comprising:

warp yarn supporting means for supporting warp threads to define a warp shed;

a slay reciprocally movable along a generally straight line in the weaving direction toward the fell of the fabric being woven on the loom and being reciprocally movable in a direction opposite to the weaving direction; means for so moving said slay; said slay having a first position, which is its position of furthest reciprocation in the weaving direction, and having a second position, which is its position of furthest reciprocation opposite to the weaving direction;

weft yarn beat up means supported on the loom to beat up the weft yarn at the fell of the fabric;

weft yarn motion guide means connected to said slay to be moved thereby; means for picking weft yarn in said guide means; said guide means comprising: a plurality of guide members and a common support on which said guide members are carried; said guide members being spaced apart across their said guide member support in the weft direction; each said guide member including means for holding a picked weft thread and including means for releasing the picked weft thread when said guide member is in a first tilted orientation and that weft thread engages a warp thread in the warp shed;

a sword arm; said guide member support having a first location at which there is a first pivot; at said first pivot, said guide member support is pivotally connected with one end of said sword arm; the other end of said sword arm being pivotally connected at a loom pivot that is located on a portion of said loom that is stationary with respect to movement of said slay; with said slay moved into said second position, said loom pivot being further in said weaving direction than said first pivot;

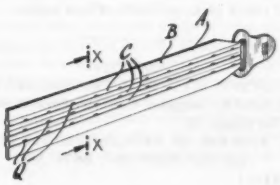
said guide member support having a second location at which there is a second pivot; at said second pivot, said guide member support being pivotally connected to said slay; said second pivot being spaced from said first pivot; said first pivot being located further in said weaving direction than is said second pivot,

whereby reciprocating movement of said slay correspondingly reciprocates said guide means and tilts said guide members so that they move along a curved pathway between an orientation at which said means for holding a picked weft thread is in the shed and said first tilted orientation at which said means for holding a picked weft thread has moved out of the shed.

3,926,227
LOAD SENSITIVE BELT

Takezo Takada, deceased, late of Tokyo, Japan, and by Juichiro Takada, legalized authorized heir, Tokyo, Japan, assignors to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1973, Ser. No. 427,282
Claims priority, application Japan, Dec. 28, 1972, 47-148602[U]
Int. Cl.² D03D 15/00
U.S. Cl. 139—383 R 3 Claims



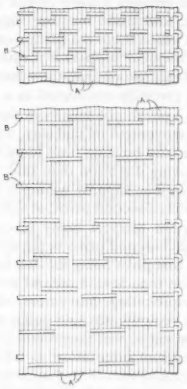
1. A load sensitive belt comprising an elongated web including longitudinally extending ground warps and indicator warps and characterized in that said indicator warps are at least partially visible along a face of said web and possess a lesser rupture elongation than said ground warps and are of different color than and visually distinguishable from said ground warps at said face of said web whereby said indicator warps rupture upon a load exceeding a predetermined value being applied to said belt less than the value of the rupture load of said belt and

the rupture of said indicator warps are observable at a face of said web.

3,926,228
CARBONACEOUS TAPES

Kenneth S. Burns, Basking Ridge; George R. Ferment, Dover, both of N.J., and Roger C. Waugh, Rock Mart, Ga., assignors to Cellanese Corporation, New York, N.Y.

Division of Ser. No. 112,189, Feb. 3, 1971, Pat. No. 3,818,082.
This application Apr. 27, 1973, Ser. No. 355,232
Int. Cl. D03d *15/00*
U.S. Cl. 139—420 R **9 Claims**



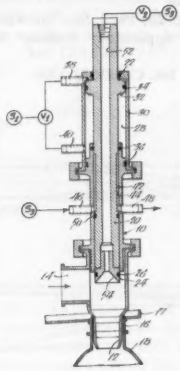
1. A tape of sateen weave construction suitable for use as a fibrous reinforcing medium when incorporated in a matrix material consisting of at least 32 adjoining substantially parallel linear warp ends of a carbonaceous fibrous material essentially coextensive with the length of said tape containing at least 90 per cent carbon by weight, and a fibrous weft pick interlaced with said warp ends at a plurality of points capable of maintaining said substantially parallel relationship of said warp ends which floats at least 4 of said warp ends prior to each additional interlacing point in the main body of said tape as said warp ends are traversed and provided at a frequency of about 0.1 to 8 picks per inch of said tape.

3,926,229
VISCOUS MATERIAL FILLING DEVICE

William R. Scholle, Compton, Calif., assignor to Scholle Corporation, Northlake, Ill.

Filed Feb. 20, 1974, Ser. No. 444,127
Int. Cl.² B65B *3/04;* **B67C** *3/02*
U.S. Cl. 141—1 **5 Claims**

1. A method for filling a container with a viscous material, comprising the steps of bringing the neck of a container into communication with a viscous material outlet, delivering viscous material through said outlet into the container until the level of material reaches the neck of the container and the viscous material extends between said outlet and the container, stopping delivery of viscous material through said outlet, then, with the neck of the container still in communication with the outlet, directing a stream of cleansing fluid under pressure through said outlet and into the neck of the container for discharging all of the viscous material in said outlet and between said outlet and the container into the container, and then removing the container from said outlet, whereupon the

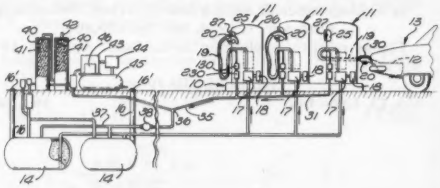


viscous material will not cone up in the container neck and said outlet will remain clean.

3,926,230
RECOVERY OF FLAMMABLE VAPORS

Marvin L. Stary, 1454 Ashland Ave.; Edward L. Brown, 1505 Lafayette Road, both of Claremont, Calif. 91711, and Eric L. Pridonoff, 727 S. Orange Grove Blvd., Apt. 7, Pasadena, Calif. 91105

Filed June 12, 1974, Ser. No. 478,519
Int. Cl.² B65B *31/06*
U.S. Cl. 141—45 **33 Claims**



1. Apparatus comprising:
a liquid dispensing system including tank means for holding a flammable liquid, hose means for dispensing said liquid, and discharge nozzle means on said hose means;
means for collecting flammable vapors of said liquid from said dispensing system and including collection line means for withdrawing vapors from the vicinity of said nozzle means during a dispensing operation;
adsorption chamber means through which said collected vapors and intermixed air are passed and containing a substance adapted to adsorb said vapors;
an engine;
means for feeding said collected vapors to the intake of said engine as its only fuel in a quantity sufficient to drive said engine solely by the combustion of said vapors, said vapor feeding means acting to progressively desorb vapors from said substance for delivery to the engine; and
means for delivering air to the intake of said engine with said collected vapors in a controlled total air-vapor ratio which is combustible in the engine to drive it solely by burning of said vapors.

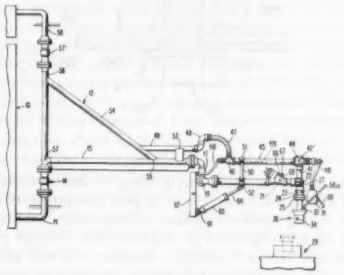
3,926,231
SYSTEM FOR LOADING LIQUID INTO A CONTAINER OR THE LIKE

Michael J. Madden, West Covina, Calif.; Robert L. Murray, Dayton, Ky.; Stephen C. Lemon, and Paul R. Ostand, both of Cincinnati, Ohio, assignors to Dover Corporation, New York, N.Y.

Division of Ser. No. 77,361, Oct. 1, 1970, Pat. No. 3,753,453. This application Mar. 15, 1973, Ser. No. 341,381

Int. Cl.² B65B *3/18;* **B67C** *3/34*

U.S. Cl. 141—192 **3 Claims**



1. A fluiid handling system including a conduit for conducting a fluid therethrough to a container or the like, conduit valve means in said conduit to regulate flow therethrough, said valve means being normally biased closed, support means, means pivotally connecting said conduit to said support means, a conduit pivoting cylinder connected with said conduit to pivot said conduit about said pivotal connecting means to move said conduit into and out of communication with the container, means urging said conduit valve means to a closed position, cylinder means to move said conduit valve means to an open position, single control means to simultaneously produce actuation of said pivoting cylinder and said moving cylinder, and fluid flow circuit means connected with said cylinder means and said pivoting cylinder and said single control means, said circuit means being responsive to said single control means, pressurized fluid flow sensing means in said circuit means, said sensing means being operatively connected with said pivoting cylinder wherein pressurized fluid is supplied to said pivoting cylinder when fluid flow is sensed by said sensing means, said sensing means insuring that said conduit valve means is closed by said urging means before said pivoting cylinder moves said conduit out of communication with the container.

3,926,232
APPARATUS FOR CUTTING PATTERN IN GUN STOCK OR OTHER WORK PIECE

Frank A. Pachmayr, Los Angeles, and Edward B. Miller, Harbor City, both of Calif., assignors to Pachmayr Gun Works, Inc., Los Angeles, Calif.

Division of Ser. No. 156,655, June 25, 1971. This application Sept. 23, 1974, Ser. No. 508,329

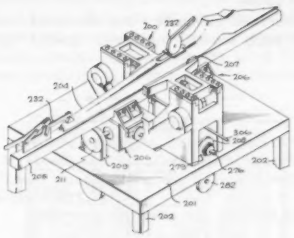
Int. Cl.² B27M *3/22*

U.S. Cl. 144—136 J **21 Claims**

1. Apparatus comprising:

a cutter structure having cutting edges arranged in a predetermined pattern which is to be essentially reproduced on a work piece;

means for producing relative vibratory movement between said cutter structure and said work piece, while the cutter structure is positioned for contact with the work piece, and in a relation progressively cutting said pattern on the work piece; and



means for shifting the work piece in a lateral direction during said relative vibratory movement and in addition thereto.

3,926,233
CONTAINER

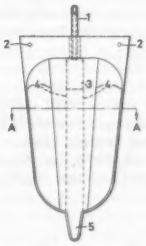
Lennart Brendling, 81, Axvagen, Jarfalla, Sweden (S-175 44)

Filed July 24, 1974, Ser. No. 491,553

Claims priority, application Sweden, July 25, 1973, 7310331

Int. Cl.² A61F *7/00*

U.S. Cl. 150—2.5 **6 Claims**



1. A container of flexible material, especially intended for collection of urine and/or faeces, which container is substantially two-dimensional in empty state and comprises two outer walls, a plurality of intermediate walls arranged between the outer walls to form an odd number of at least three chambers which are in connection with each other, and an inlet provided with a valve leading to the container, the same number of intermediate walls being arranged on both sides of an imaginary line passing through the middle chamber and extending in the longitudinal direction of the container, the intermediate walls being connected to the outer walls along joints extending in the longitudinal direction of the container and at least one distance between the joints of two adjacent intermediate walls at one outer wall being greater than the distance between the joints of the same adjacent intermediate walls at the other outer wall.

3,926,234
CONTAINER FOR STORING KEYS

Gerald R. Dean, Minneapolis, Minn., assignor to Stanley W. Dahlmeier, Minneapolis, Minn.

Filed July 20, 1972, Ser. No. 273,490

Int. Cl.² A45C *11/32*

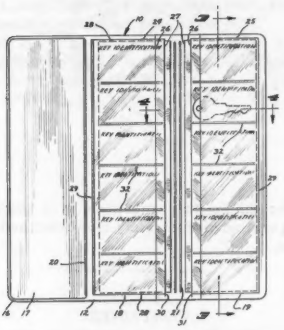
U.S. Cl. 150—40 **2 Claims**

1. In a folder for storing extra keys,

a. a backing member having two equal panels foldable against each other along a center line,

b. an inner wall secured along three sides to the inner side of each panel to form a card pocket between the inner wall and panel,

c. said inner wall comprising two sheets of transparent material being secured together at spaced intervals to



form a series of key receiving pockets opening toward the center line and each adapted to receive an individual key,

d. an identification card disposed between the inner wall and panel and extending the length of the inner wall and adapted to receive data observable through the inner wall to identify the key in each of said pockets.

3,926,235

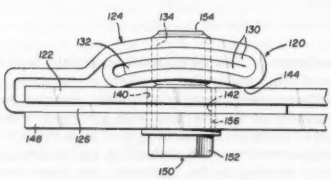
NUT, CLIP AND PANEL ASSEMBLY

William C. Wehner, Clarence Center, N.Y., assignor to Multifastener Corporation, Detroit, Mich.

Filed Mar. 25, 1974, Ser. No. 454,056

Int. Cl.[2] F16B *39/28*

U.S. Cl. 151—21 C **4 Claims**



1. A nut member, comprising: a continuous, relatively thin resilient strip spirally interfolded upon itself and permanently flattened to define at least four laminae in face-to-face contact, a continuous bore through said laminae having a continuous, spiral female thread formed therein, said laminae symetrically concave about the axis of said bore defining a bearing face equally spaced on opposite sides of said bore on the concave side of said nut member, said lamina retained at their opposite sides within the spiral folds of the outer adjacent lamina of said strip, with the central portion including said bore spaced from the plane of said bearing face and free to flex in the axis of said bore, whereby said nut member laminae function as a single unit upon threading a male threaded fastener in said bore, through said concave side of said nut member, and permitting said laminae to resiliently flex about said bearing face upon torquing of the male threaded fastener, the thickness of the laminae equal to approximately the thread pitch.

3,926,236

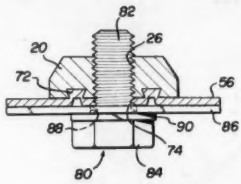
SELF-FASTENING NUT, PANEL ASSEMBLY AND APPARATUS

Thomas M. Pouch, Farmington, and Harold A. Ladouceur, Livonia, both of Mich., assignors to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 302,312, Oct. 30, 1972, Pat. No. 3,829,957. This application Mar. 25, 1974, Ser. No. 454,656

Int. Cl.[2] F16B *37/04*

U.S. Cl. 151—41.73 **11 Claims**



1. A structural assembly, comprising, in combination, a nut having a cylindrical central bore, a pilot portion surrounding said bore having a planar end face, a groove adjacent said pilot end face on opposite sides of said bore and a flange portion having an end face substantially coplanar with said pilot end face, a panel engaging said coplanar end faces of the nut in overlying relation and having a circular opening coaxially aligned with said nut bore, said panel coplanar with said pilot adjacent said opening, the internal diameter of said circular opening being substantially equal to the internal diameter of said nut bore, said panel having a portion disposed within said nut groove and said groove having a restricted opening including a portion overlying a bottom wall configured to retain said nut on said panel in interlocking relation, the inner panel edge defining said panel opening and said nut bore having a continuous female thread, a structural member overlying said panel, opposite said nut, having a hole in registry with said panel opening, and a self-tapping male threaded fastener threadably received in said continuous female thread of said panel edge and said nut bore, retaining said structural member to said panel.

3,926,237

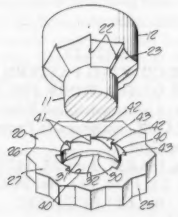
SELF-LOCKING VIBRATION-PROOF LOCK WASHER AND COOPERATING THREADED FASTENER

Max L. Enders, 965 N. Fair Oaks, Pasadena, Calif. 91103

Continuation-in-part of Ser. No. 239,488, March 30, 1972, abandoned. This application Aug. 2, 1973, Ser. No. 384,811

Int. Cl.[2] F16B *39/282*

U.S. Cl. 151—34 **26 Claims**



10. A self-locking vibration-proof fastener comprising a threaded shank having a wrench-seating retainer means at one end thereof, said retainer means having a frusto-conical surface sloping inwardly toward the axis of said threaded shank at an obtuse angle with the smaller end of said frusto conical surface substantially merging with said shank and having a

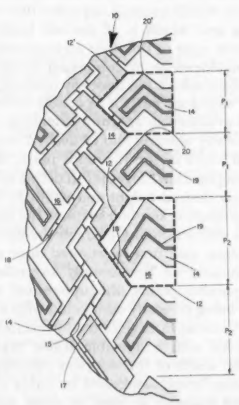
ring of shallow teeth each having a generally radial face and a relatively long helical face having a pitch substantially in excess of the pitch of said shank threads, a wrenchable lock washer encircling said shank having an axial bore fitting loosely about said threaded shank, substantial portions of said bore on the end half thereof adjacent said frusto-conical surface being generally cylindrical, the rim edge of said bore adjacent said ring of shallow teeth on said retainer means having a ring of similar long shallow notches of varying depth circumferentially of said rim edge adapted to internest partially with the leading higher end of a respective one of said shallow teeth on said retainer means, said notches having a long generally helical surface having a pitch substantially in excess of the pitch of said shank threads and merging at the deeper end thereof with a generally radially disposed end wall surface, the lateral edges of said end wall and of said helical surface converging and merging with the rim edges of said washer bore at the respective opposite ends of said notches, the deeper end portion of said teeth on said retainer means having load bearing contact with the shallow end of a respective one of said notches in an area immediately adjacent the rim edge of said cylindrical bore and adjacent the sidewall of said threaded shank as the generally radial faces of said teeth engage said generally radial end wall of said notches whereby the tightening of said fastener loads said washer in hoop tension from a plurality of areas located about the periphery of said washer substantially at the rim edge of said cylindrical bore, and the end face of said washer remote from said notches having a ring of row-height sharp-edged barb-like teeth extending generally radially thereacross with one face of each inclined acutely and the other face inclined obtusely to said one end face and in directions to cam said washer over the surface of a workpiece as said fastener is wrenched to tighten the same and to dig into the surface of the workpiece upon any tendency of the fastener to rotate in a loosening direction.

3,926,238

MODULATING NOISE PRODUCED BY ROTATING BODIES

William J. Vorih, Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Aug. 31, 1971, Ser. No. 176,460
Int. Cl.² B60C *11/08*
U.S. Cl. 152—209 **13 Claims**



1. In a tire construction having an outer tread portion divisible into a plurality of discrete design elements extending circumferentially about the tire, not all of said design elements having identical pitch lengths, the improvement comprising:

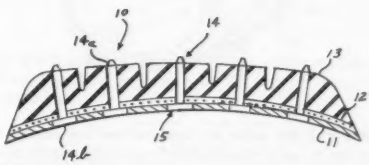
providing the tire tread with sequenced design elements in which the sequence is characterized by comprising in at least a portion thereof of a plurality of strings of design elements, each string consisting of three or more consecutive design elements of substantially identical pitch length, the length and sequential positioning of said strings selected to modulate the tread frequency harmonic produced upon impact of the road by the tire.

3,926,239

STUDDED REPLACEABLE TREAD TIRE

Aivars V. Petersons, 1925 Little York Road, Dayton, Ohio 45414, and Howell K. Brewer, 1921 N. Longview St., Dayton, Ohio 45432

Filed Aug. 21, 1974, Ser. No. 499,231
Int. Cl.² B60C *11/16*
U.S. Cl. 152—210 **3 Claims**



1. A replaceable tread belt assembly for a pneumatic tire, comprising; a radially-inwardmost, cushion layer disposable around and in contact with the carcass of a pneumatic-type tire when the tread belt is in its mounted condition; a replaceable-type of tread belt having a tire tread-reinforcing means such as at least one cord reiforcing ply layer at the inside surface thereof positioned in intermediate and sealing contacting relation respectively between the outside and inside surfaces of said cushion layer and tread belt; a plurality of anti-skid/traction studs each having integral, relatively elongated shank and relatively enlarged head portions, and being supported by and projecting out of the outside surface of said tread belt for contact with the pavement or other road surface; and stud-mounting means for mounting each of said plurality of studs in removable relation within, and extending completely through said tread belt from the inside to the outside surfaces thereof including the said cushion and cord reinforcing ply layers; said stud-mounting means being premolded in said tread belt including said cushion and tire tread-reinforcing means during cure, and including a separate socket for releasably receiving therewithin each of said plurality of studs; each of said sockets being of a stepped diameter configuration incorporating a relatively narrow and elongated socket portion extending entirely through said tread belt including its reinforcing ply layer for positioning therewithin a respective stud shank portion with a slight interference fit to thereby permit the relatively easy hand or manual installation and removal thereof; and an enlarged diameter portion incorporated within said cushion layer and thus being oriented entirely and immediately below the inside surface of the cord reinforcing ply layer for thereby positioning the said enlarged stud-head portion of a corresponding stud in a positive anchored relation relative to, and just behind the said cord reinforcing ply layer when said tread belt is mounted to the carcass of a pneumatic tire.

3,926,240

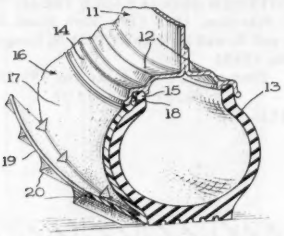
AUXILIARY TRACTION MEANS FOR VEHICLE WHEELS

Bryan W. Nickerson, Jr., 200 Lore Ave., Wilmington, Del. 19809

Filed Nov. 16, 1972, Ser. No. 307,115
Int. Cl.² B60C *27/02*
U.S. Cl. 152—226 **1 Claim**

1. The combination with a vehicle wheel and tire having its outer periphery adapted to roll over surfaces ranging in hard-

ness from unyielding to yielding, traction means mounted on said wheel and tire, said traction means constructed of a resilient material in the form of an annular collar in opposed relationship to the lateral face of the side wall of said tire and a plurality of spaced traction lugs arranged contiguous the outer periphery of said collar, said traction lugs inoperatively positioned radially within the outer periphery of said tire, said traction lugs being responsive to the centrifugal force of said wheel whereby they are caused to radiate outwardly beyond the outer periphery of said tire, there being a resistance means



associated with said collar and said traction lugs causing said traction lugs to resist being radiated outwardly relative to said collar, the radially inner portion of said collar remains fixed relative to the lateral face of said tire, said resistance means characterized as a resilient stiffness that will cause said traction lugs to resist being radiated outwardly beyond the outer periphery of said tire until a predetermined number of revolutions per minute of said wheel is reached whereby the activation of said traction lugs is dependent upon the elective speed of the wheel.

3,926,241

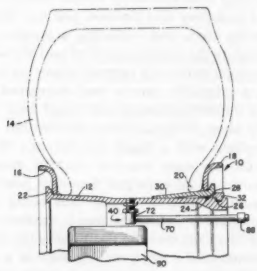
FITTING STRUCTURE FOR TIRE RIM

Peter P. Evankovich, Butte; Robert J. Madden, Divide, and Edward M. Peterson, Butte, all of Mont., assignors to The Anaconda Company, New York, N.Y.

Filed Apr. 10, 1974, Ser. No. 459,592

Int. Cl.[2] B60C *29/00*

U.S. Cl. 152—415 **2 Claims**



1. In combination: a rim assembly for an oversized off-the-road vehicle including a cylindrical base, a pair of annular flanges received around the base adjacent the peripheries, each of the flanges supporting a portion of the outer wall of a tire adjacent an inner bead thereof which is disposed substantially within the region of the junction of the cylindrical base and flange, means for retaining each of the flanges on the cylindrical rim and the tire therebetween so that the tire may be inflated, and a tapped bore formed in the cylindrical base between the flanges; a fitting in the form of a member having an elongated cylindrical shank and a through-bore of substantially constant diameter, the member including abutment means on the shank between the ends, and threaded partially along the length of the shank from the abutment means toward one end and along the length of the shank from the abutment means toward the other end, the latter thread being relatively coarser for threadedly receiving the member into the bore so that the abutment resides juxtaposed to the cylindrical base; and means for communicating a pressurizing fluid to the tire interior for inflating the same including connector means for threaded receipt on the shank from the one end, a conduit mounted by the connector and extending from the connector along the cylindrical base at least to the region of one of the flanges, and a valve in the conduit remote from the connector for opening and closing fluid communication with the tire.

3,926,242

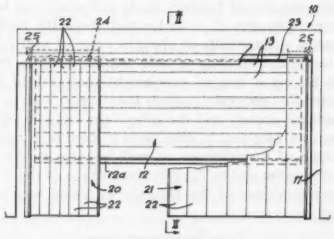
DOORS

Kenneth Lowe, Stockport, England, assignor to Simon-Carves Limited, Stockport, England

Filed Jan. 2, 1974, Ser. No. 429,843

Int. Cl.[2] E06B *3/32*

U.S. Cl. 160—89 **1 Claim**



1. In combination with a shed for the building of a ship by the so-called extrusion method said shed having a doorway opening in one end through which the ship under construction is extruded in successive steps as it grows in length, means for defining a rectangular aperture of any predetermined height and width within the perimeter of said doorway opening comprising two door arrangements disposed one behind the other at said doorway opening, means whereby one of said door arrangements is operable upwardly to an adjustable extent to define an aperture which extends over the full width of the doorway opening and which is of desired height from the ground to the lower edge of the door arrangement, the other of said door arrangements being comprised by two door parts disposed one on each side of the doorway opening, and means whereby each of said door parts is openable outwardly to an adjustable extent to define an aperture extending over the full height of the doorway opening and of desired width between the inner vertical edges of the two door parts, the two door arrangements being operable together to define said rectangular aperture of any desired height and width to conform the effective doorway opening size and shape to the size and shape of the part of the ship extending through the doorway at any time during building, said first mentioned door arrangement comprising a plurality of horizontally extending pivotally interconnected parallel plates, the uppermost edge of the uppermost plate being pivotally connected with a fixed frame member and the lowermost edge of the lowermost plate being pivotally connected with a movable frame member which extends across the width of the doorway opening, said movable frame member being suspended by cable means which can be raised and lowered to open or close said first door arrangement to a desired extent, and means for moving said cable means to open and close said first door arrangement, and each of said door parts of the second mentioned door arrangement comprising a plurality of vertically extending pivotally interconnected parallel plates whose upper ends are

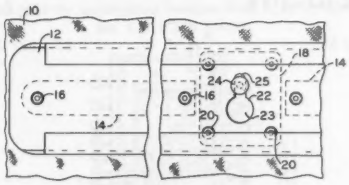
suspended from a track running along the upper edge of the doorway opening, and means for moving the innermost plate of said each door part inwardly or outwardly across the doorway opening, each of said means for moving said door parts and said means for moving said cable means being operable independently of one another.

3,926,243

CARGO CONTAINER LATCHES

John W. Lovich; Oscar W. Meller, both of Akron, Ohio, and Walter F. Sprick, Phoenix, Ariz., assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Feb. 11, 1974, Ser. No. 441,616
Int. Cl.² A47H *23/00*; E05C *1/04*
U.S. Cl. 160—328 **10 Claims**



1. A latch system for use on a cargo container having a frame work, base, and a fabric door for closing an opening allowing access to the interior thereof, comprising:

a first rigid member connected to and horizontally traversing the fabric door and dividing the door into at least two sections;

a plurality of first latch assemblies connected to and spaced along the first rigid member;

a second rigid member connected to and horizontally traversing the fabric door at the bottom thereof; and

a plurality of second and third latch assemblies connected to the second rigid member, the second latch assemblies securing the positioning of the fabric door over the opening and the third latch assemblies, separate and distinct from the second latch assemblies and interposed therebetween, maintaining the engagement of the second latch assemblies.

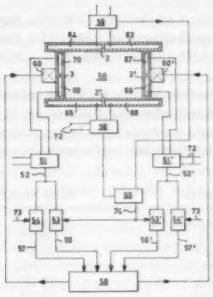
3,926,244

METHOD OF CONTROLLING THE COOLING RATE OF NARROW SIDE WALLS OF PLATE MOLDS AS A FUNCTION OF THE CASTING TAPER DURING CONTINUOUS CASTING

Walter Meier, Winterthur; Josef Zeller, Weesen; Peter J. Koenig, Zumikon; Werner Bruderer, Feldmeilen, and Markus Schmid, Zurich, all of Switzerland, assignors to Concast AG, Zurich, Switzerland

Filed Mar. 25, 1974, Ser. No. 454,682
Claims priority, application Switzerland, Mar. 30, 1973, 4599/73
Int. Cl.² B22D *11/02*
U.S. Cl. 164—4 **15 Claims**

1. A method of controlling the cooling rate of the narrow side walls of a plate mold during continuous casting, said plate mold further possessing wide side walls, wherein the narrow side walls of the mold are fixedly clamped between the wide side walls of the mold, prior to the start of the casting operation the hollow mold compartment is provided between the narrow side walls with a casting taper which converges in the direction of travel of the cast strand and which is accommodated to the quality of the steel and the width of the strand, the improvement comprising the steps of prior to starting the casting operation additionally adjusting the casting taper to a reference value corresponding to at least one prescribed casting parameter, and upon deviation of the casting parameter during the casting operation altering the casting taper according to predetermined reference values which produce a desired cooling effect and corresponding to such changing casting parameter.

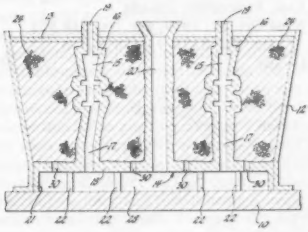


3,926,245

METHOD FOR PRODUCING DIRECTIONALLY SOLIDIFIED CAST ALLOY ARTICLES AND APPARATUS THEREFOR

Randel R. Kanaby, Lebanon, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 28, 1973, Ser. No. 401,694
Int. Cl.² B22D *15/00*, *27/04*
U.S. Cl. 164—53 **3 Claims**



1. A method for casting directionally solidified articles comprising:

providing a mold assembly including an article forming mold portion having a cavity in the shape of the article to be cast and a bottom inlet sprue, a chill plate below said mold portion, support means associated with said mold portion operative to support said mold portion on said chill plate in spaced relation to provide a chamber between said sprue and said chill plate with said sprue being in communication with said chamber, a vertical downgate communicating with said chamber, an exothermic composition about said mold portion exposed to said chamber,

pouring a molten metal into said downgate, said molten metal filling said chamber and said mold cavity and simultaneously contacting and igniting said exothermic material only at said chamber, said burning exothermic material initially heating said mold above the melting temperature of said molten metal within said mold portion without contacting said molten metal,

withdrawing heat by means of said chill plate from the metal in said chamber and progressively from the metal in said sprue and said cavity whereby the metal in said cavity is directionally solidified.

3,926,246
FLUX FOR CONTINUOUS CASTING OF STEEL

Paul M. Corbett, Baltimore, Md., and Michael P. Fedock, Seven Hills, Ohio, assignors to SCM Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 290,196, Sept. 18, 1972, abandoned. This application Feb. 20, 1974, Ser. No. 444,072
Int. Cl.² B22D *27/20;* **C22B** *9/10;* **C03C** *3/16*
U.S. Cl. 164—56 **6 Claims**

1. A flux composition having flowidity, plastic deformation point, and alumina solubility suitable for use in the continuous casting of steel, said composition being substantially in the vitreous state as frit particles, and consisting essentially of:

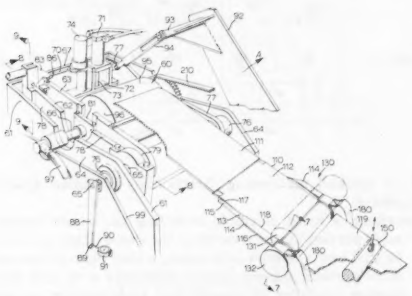
Ingredients	% by Weight
Na_2O	18–24
K_2O	0–10
Li_2O	2.5–6
SiO_2	1–20
P_2O_5	10–40
Al_2O_3	0–25
F	0–10
MgO	5–20
CaO	5–20
BaO	5–20
SrO	5–20
B_2O_3	0–6

and wherein the percentages of said ingredients total 100% by weight.

3,926,247
LEAD SHEET CASTING MACHINE

Kenneth Daniel Geiger, Port Credit; Steven Joseph Horvath, Mississauga; Victor Paul Kallay, Toronto; Theodore Joseph Seymour, Oakville; Thorpe Wesley Watson, Oakville, and John Zervoudis, Oakville, all of Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Oct. 29, 1974, Ser. No. 518,851
Int. Cl.² B22D *11/126, 11/06*
U.S. Cl. 164—263 **29 Claims**

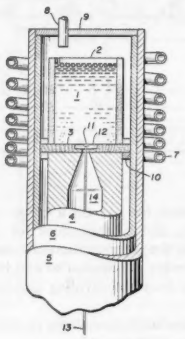


1. In a machine for casting metal sheet from molten metal by rotating a drum in a pool of said molten metal contained in a trough for casting of the metal onto the drum and withdrawal of said cast metal as a continuous sheet, support means for raising and lowering said drum and for leveling said drum comprising: a stationary outer frame enclosing the casting trough on its sides and at least one end, an inner adjusting frame pivotally mounted at one end within said stationary outer frame and enclosing the casting trough on its sides and its end opposite the pivotal mounting having said drum journalled in bearings secured therein, means for raising and lowering the inner frame relative to said outer stationary frame for angular rotation about the pivotal mounting for coarse and fine adjustment of the height of the drum in the casting trough, said coarse adjustment for placement of the drum in a lower position in the trough to immerse the drum periphery to a preset depth below the surface of molten metal in the trough and placement of the drum in an upper position to remove the drum periphery from said molten metal in the trough and said fine adjustment for providing changes in said preset depth, means for raising or lowering one side of said inner frame relative to the other side for adjusting the level of the drum, and means connected to said inner frame for pivoting said inner frame out of contact with said stationary outer frame for removal of the drum from the casting trough.

3,926,248
ORIFICE STRUCTURE FOR EXTRUDING MOLTEN METAL TO FORM FINE DIAMETER WIRE

Jerome J. English, Cary, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 11, 1973, Ser. No. 405,388
Int. Cl.² B22D *11/00*
U.S. Cl. 164—273 R **3 Claims**

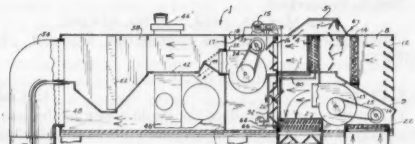


1. In an apparatus for extruding molten metal to form fine diameter wire, said apparatus being characterized by a crucible assembly for containing a molten metal charge and having an orifice defining element as an essential part thereof, means for forcing molten metal contained in the crucible through an orifice in said orifice defining element and heating means for maintaining said charge in the molten state, the improvement which comprises: an orifice defining element which is composed of polycrystalline thorium oxide having a density of from 9.5 to 10.0 gm/cm³ and a purity of at least **99.5** percent.

3,926,249
ENERGY RECOVERY SYSTEM

Walter P. Glancy, 7120 Baxtershire, Dallas, Tex. 75230

Filed Dec. 11, 1973, Ser. No. 423,844
Int. Cl.² F24F *3/14*
U.S. Cl. 165—3 **7 Claims**



1. A method of recovering maximum energy from air exhausted from an enclosure comprising the steps of: delivering air from inside the enclosure through an exhaust passage to the outside of the enclosure; delivering fresh air from the outside the enclosure through an inlet passage to the inside of

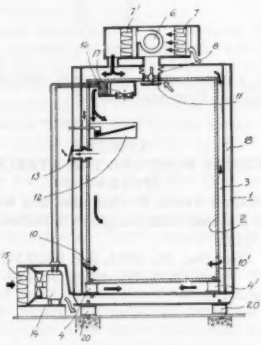
the enclosure; positioning a first heat exchanger in the inlet passage; positioning a second heat exchanger in the outlet passage; circulating liquid in a closed circuit through the first and second heat exchangers to transfer maximum energy between the inlet and outlet passages; and maintaining the mass flow rate of the liquid substantially equal to one-half the sum of the mass flow rates of all the air flowing over the first and second heat exchangers multiplied by the apparent specific heat of the respective air streams and divided by the specific heat of the liquid to maintain a maximum heat transfer rate from air exhausted from the enclosure to fresh air.

3,926,250

WORK CABIN FOR UNHEALTHY ENVIRONMENTS

Bertil Engwall, Solna, Sweden, assignor to AB Sveadiesel, Solna, Sweden

Filed Dec. 6, 1973, Ser. No. 422,142
Claims priority, application Sweden, Dec. 7, 1972, 15993/72
Int. Cl.² F25B *29/00*
U.S. Cl. 165—48 **10 Claims**



1. A work cabin for use in unhealthy environments comprising: two cabin-shaped containers comprising an inner container positioned within an outer container and spaced therefrom to form an air space surrounding said inner container; at least one inlet connecting said air space with the space contained by the inner container; fan means with at least two air filter means spaced from each other; outside air inlet means positioned on the upstream side of a first filter means; outlet means on the downstream side of a second filter connecting to said air space; a second outlet means for exhausting the air from said space in the inner container to a plenum between the downstream side of the first filter means and the upstream side of the second filter means; and a number of vibration-absorbing elements made of elastic material separating said inner and outer containers.

3,926,251

RECUPERATOR STRUCTURES

Yu K. Pei, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 16, 1973, Ser. No. 333,402
Int. Cl. F28d *9/00*
U.S. Cl. 165—165 **28 Claims**

1. A recuperator heat exchange assembly, comprising

a. a first plurality of layers of tubes, each tube in said plurality of layers having open ends and a portion intermediate the open ends which is essentially parallel to corresponding intermediate portions of the other tubes in the same layer and to corresponding intermediate tube portions in the other of said first plurality of layers to form a first series of longitudinally extending essentially parallel passageways for receiving a first fluid;

b. a second plurality of layers of tubes, each tube in said second plurality of layers having open ends and a portion intermediate the open ends which is essentially parallel to corresponding intermediate portions of the other tubes in the same layer and to corresponding intermediate tube portions in the other of said second plurality of layers to form a second series of longitudinally extending essentially parallel passageways for receiving a second fluid;

c. the intermediate tube portions of each of said first plurality of layers being disposed adjacent to, essentially parallel with, and at heat exchange relationship with the intermediate tube portions of att least one of said second plurality of layers; and the intermediate tube portions of each of said second plurality of layers being disposed adjacent to, essentially parallel with, and in heat exchange relationship with intermediate tube portions of at least one of said first plurality of layers, thereby forming a stacked array of tubes having four sets of open ends for receiving and discharging first and second fluids;

d. the portions of the tubes in each of one of said first and second pluralities of layers between the intermediate portions thereof and a first set of the open ends thereof extending obliquely with respect to the intermediate portions thereof to position said first set of open tube ends outside of said stacked array of tubes, thereby forming a first plurality of obliquely extending tube portions having a first of said four sets of open ends outside of said stacked array and available for connection to a first header means;

e. another portion of each of the tubes in each of one of said first and second pluralities of layers between the intermediate portions thereof and a second set of the open ends thereof extending obliquely with respect to the intermediate portions thereof to position said second set of open tube ends outside of said stacked array of tubes, thereby forming a second plurality of obliquely extending tube portions having a second of said four sets of open ends outside of said stacked array and available for connection to a second header means;

f. the remaining two portions of the tubes in said first and second pluralities of layers between the intermediate portions thereof and the third and fourth sets of the open ends thereof extending outwardly from the intermediate portions thereof to position said third and fourth sets of open ends away from the stacked array of contiguous intermediate tube portions and away from each other to form third and fourth sets of open ends available for connection to third and fourth header means; and

g. header connecting means for each of said four sets of open ends substantially coextensive with the open ends of each set and for closing the spaces between and around the open ends of each set to prevent leakage of said fluids between a header means and the tube ends of each set;

h. said tubes and said header connecting means being constructed of material having essentially zero porosity, consisting essentially of an inorganic crystalline oxide ceramic material, and having an average coefficient of lineal thermal expansion of about -18 to $+50 \times 10^{-7}$/°C over the range of 0° – 300°C;

i. said stacked layers of tubes and said header connecting means being fused together to form an integral assembly.

3,926,252

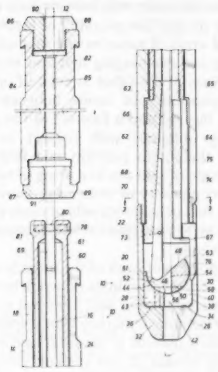
LINE CUTTING DEVICES

Jean-Paul Ribeyre, and Claude Marty, both of Cesson, France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Sept. 19, 1974, Ser. No. 507,183
Int. Cl.² E21B *29/00*
U.S. Cl. 166—54.6 **13 Claims**

1. A cutting device adapted for cutting a flexible line on which a well tool is suspended in a well, comprising: an elongated body having a longitudinally extending channel adapted

to slidably receive the line to be cut; a first blade member fixedly mounted in said body and having a first surface defining a first cutting edge with a recessed middle portion, said first cutting edge being disposed around one side of said channel; a second blade member having a second surface slidably mounted on said first surface, said second surface defining a second cutting edge having a recessed middle portion, said second cutting edge being movable from a position around the opposite side of said channel along a path intersecting said



channel substantially perpendicularly to the longitudinal axis thereof; and an actuating member engageable with said second blade member responsive to longitudinal force for causing sliding movement of said second blade member to cut the line, said first and second surfaces being coaxially disposed cylindrical surfaces with their common axes extending perpendicularly through the longitudinal axis of said channel, thereby producing a rotation of said second blade member about said common axis during said sliding movement.

3,926,253

WELL CONDUIT CEMENTING ADAPTER TOOL

John A. Duke, 1311 Beaumont St., Apt. 44, Baytown, Tex. 77520

Filed May 28, 1974, Ser. No. 473,487
Int. Cl.[2] E21B *33/05*
U.S. Cl. 166—88 **17 Claims**

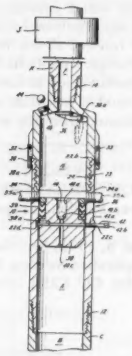
1. A well conduit adapter for use during cementing of a well conduit in a well, including:

a substantially tubular adapter housing having an upper end and a lower end;

means mounted with said lower end of said adapter housing for connecting said adapter housing with the well conduit to be cemented;

means mounted with said upper end of said adapter housing for connecting said adapter housing with a drilling kelly; said housing having a flow passage extending therethrough for communicating the flow passage of the drilling kelly with bore of the well conduit; and

plug means releasably disposed in said housing and having a closable opening formed therethrough for enabling circulation through said opening and said flow passage when said plug means is disposed in said housing and operable when actuated to move from said housing to



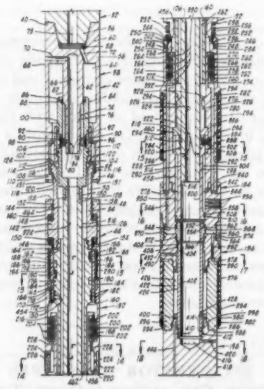
reduce contamination of cement moving through said flow passage from said housing.

3,926,254

DOWN-HOLE PUMP AND INFLATABLE PACKER APPARATUS

Robert T. Evans; Alonzo E. Cummins, and Merlin F. Anderson, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 20, 1974, Ser. No. 534,702
Int. Cl.[2] E21B *43/00*, *33/127*
U.S. Cl. 166—106 **20 Claims**



1. A down-hole pump and inflatable packer tool adapted to be lowered on a tubular member into a well for isolating at least one zone in the well, comprising:

a tubular upper housing assembly having an upper end portion and a lower end portion and positioned below the tubular member;

means for securing the upper end portion of said upper housing to the tubular member in communication therewith;

a tubular lower housing assembly positioned below said upper housing assembly and having an upper end portion and a lower end portion;

a tubular mandrel assembly having an upper end portion and a lower end portion with the upper end portion thereof secured in communication with the lower end portion of said upper housing assembly in nonrotatable, longitudinal sliding engagement therewith, and with the lower end portion thereof in communication with the upper end portion of said lower housing assembly in rotatable engagement therewith;

an annular pump cavity formed within said tubular lower housing intermediate the inner periphery thereof and the outer periphery of said tubular mandrel assembly;

an annular pump piston longitudinally slidably disposed within said annular pump cavity;

a pump intake passageway in said lower housing assembly communicating between said annular pump cavity and the exterior of said lower housing assembly;

intake check valve means disposed in said pump intake passageway for permitting fluid flow from the exterior of said lower housing assembly through said intake passageway to said annular pump cavity and, alternately, preventing fluid flow through said intake passageway in the opposite direction;

inflatable packer means carried by said lower housing assembly for expanding to seal against the wall of the well to isolate at least one zone in the well in response to the application of fluid pressure to the interior thereof;

a pump exhaust passageway in said lower housing assembly communicating between said annular pump cavity and the interior of said inflatable packer means;

exhaust check valve means disposed in said pump exhaust passageway for permitting fluid flow from said annular pump cavity through said exhaust passageway to the interior of said packer means and, alternately, preventing fluid flow through said exhaust passageway in the opposite direction; and

means mutually interconnecting said tubular mandrel assembly, said annular pump piston and said lower housing assembly for inparting longitudinal reciprocal motion to said annular pump piston within said annular pump cavity in response to rotation of said upper housing assembly relative to said lower housing assembly by the tubular member to pump fluid from the well into said inflatable packer means through said pump intake passageway and intake check valve means and said pump exhaust passageway and exhaust check valve means to expand said inflatable packer means against the wall of the well to isolate at least one zone in the well.

3,926,255
WATERFLOODING EMPLOYING SURFACTANTS DERIVED FROM METALLIC SOAPS

Sherrod A. Williams, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 7, 1974, Ser. No. 521,595
Int. Cl.² E21B *43/22*
U.S. Cl. 166—270 **4 Claims**

1. In the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems, the method comprising:

a. contacting a petroleum oil containing divalent metal soaps with an aqueous mineral acid solution to convert said soaps to organic acids,

b. injecting said organic acids into said reservoir via said injection system,

c. injecting into said reservoir via said injection system an aqueous alkaline solution to neutralize said organic acids to surface-active monovalent metal soaps,

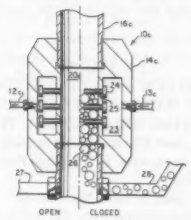
d. thereafter introducing into said reservoir via said injection system an aqueous flooding medium to displace oil to said production system, and

e. recovering oil from said production system.

3,926,256
METHODS AND APPARATUSES FOR CONTROLLING AND PREVENTING BLOW-OUTS IN WELLS

Richard H. McCall, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 383,867, July 30, 1973, abandoned. This application Dec. 9, 1974, Ser. No. 530,782
Int. Cl.² E21B *33/035, 35/00*
U.S. Cl. 166—285 **10 Claims**



1. A method for controlling fluid flow and preventing blow-outs in offshore well including a well tubing extending from the bottom up to the surface of a body of water comprising the method steps of,

a. forming a chamber in a housing for interconnecting two ends of the well tubing,

b. forming actuatable pins in the housing for being extendible into the chamber and for being retractable from the chamber,

c. inserting sealer material below the pins for catching and lodging on the extended pins for forming an impermeable plug for sealing the well tubing fluid tight, and

d. retracting the pins from the chamber for opening the wall tubing to free full fluid flow.

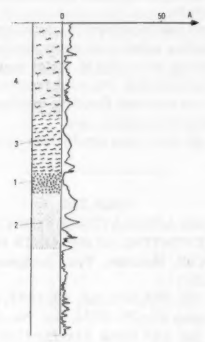
3,926,257
WELL CEMENTING PROCESSES

Jacques Marrast, Marly-le-Roi; Louis Minssieux, Rueil-Malmaison, and Eric Biondin, Montesson, all of France, assignors to Gaz de France and Institut Francais du Petrole, both of, France

Filed May 14, 1974, Ser. No. 469,822
Claims priority, application France, May 18, 1973, 73.18124
Int. Cl.² E21B *33/13, 43/00*
U.S. Cl. 166—293 **26 Claims**

1. In a process for cementing a casing in a well traversing at least one gas-containing formation in which cement is placed in the annulus formed between the wellbore and the casing, the improvement wherein cementing is effected by injecting a

cement slurry containing a foaming agent which by cooperating with the gas of the formation produces a foam barrier which prevents any subsequent migration of gas through the cement slurry during the setting of the cement slurry.



3,926,258

METHOD FOR REDUCING FORMATION PERMEABILITY WITH GELLED POLYMER SOLUTION HAVING DELAYED GEL TIME

James E. Hessert, and Chester C. Johnston, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 318,847, Dec. 27, 1972, abandoned. This application Feb. 12, 1974, Ser. No. 441,848

Int. Cl.[2] E21B *33/138, 43/22*

U.S. Cl. 166—294 **14 Claims**

1. A method for altering the permeability of a subterranean formation with a gelled solution of a polymer having an increased gel time, which method comprises:

mixing (a) one of a polyacrylamide, a polysaccharide, a cellulosic polymer, or mixtures thereof, (b) a compound of a multivalent metal capable of furnishing multivalent metal ions, and (c) water, to form a first mixture;

thereafter mixing a complexing agent with said first mixture to form a second mixture;

thereafter forming a third mixture by mixing with said second mixture a reducing agent capable of reducing at least a portion of said multivalent metal ions to a reduced valence state and cause gelation of said solution;

said complexing agent being capable of complexing with at least a portion of said reduced multivalent metal ions to provide said increased gel time; and

passing said third mixture having an increased gel time into said formation.

3,926,259

METHOD FOR NORMALIZING STRESSES AND STRAINS IN A WELL CASING IN A PERMAFROST ZONE

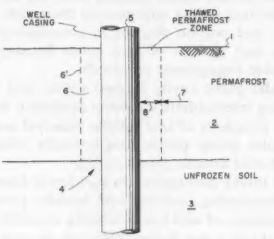
Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 31, 1975, Ser. No. 563,598

Int. Cl.[2] E21B *43/00;* **E02B** *3/00;* **E21B** *7/00*

U.S. Cl. 166—302 **7 Claims**

1. A method for rendering stresses and strains more uniform throughout a length of well casing that is adjacent an at least partially thawed permafrost zone, said thawed zone containing thawed soil and liquid in the pores thereof, said thawing having been caused by one or more well operations, said method comprising at least limiting said well operations so that refreezing can occur in at least part of said thawed zone, allowing said refreezing to occur in said thawed zone until said casing can physically move relative to said thawed soil, and thereafter continuing said well operations.



3,926,260

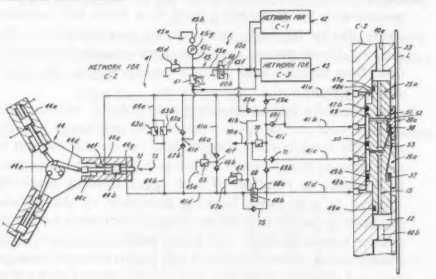
WIRELINE CONTROL SYSTEM AND METHOD

Damon T. Slator, Houston, Tex., assignor to Bowen Tools, Inc., Houston, Tex.

Filed May 28, 1974, Ser. No. 474,029

Int. Cl.[2] E21B *19/08*

U.S. Cl. 166—315 **34 Claims**



1. A wireline control unit for moving a wireline in a well, comprising:

a housing adapted for mounting on a well tubing extending downhole in a well and pressure control means for maintaining said housing substantially at well pressure;

an actuator assembly mounted in said housing for movement longitudinally thereof between first and second positions;

gripping means for grippingly engaging said wireline, said gripping means being mounted for longitudinal movement with said actuator assembly and for relative movement with respect thereto for alternately gripping and releasing said wireline; and

a fluid system connected with said actuator assembly for movement thereof for feeding said wireline longitudinally into the well with said gripping means or for braking movement of said wireline when the wireline is coming out of the well.

20. A method for sequentially moving a wireline into and out of a well, comprising the steps of:

gripping said wireline with a first gripping means and moving said wireline through a first stroke portion;

gripping said wireline with a second gripping means and moving said wireline through a second stroke portion;

releasing said first gripping means from said wireline after said wireline is gripped by said second gripping means whereby said wireline is sequentially gripped and released to move said wireline into or out of said well;

gripping said wireline with a third gripping means and moving said wireline through a third stroke portion; and

releasing said second gripping means for said wireline after said wireline is gripped by said third gripping means.

3,926,261

HARROW DEVICE

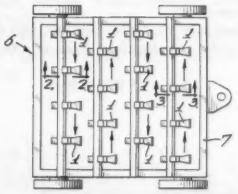
Jonas F. Kjellberg, Frielsberg, Sweden, assignor to SKF Industrial Trading and Development Company B.V., Jutphaas, Netherlands

Filed Nov. 14, 1974, Ser. No. 523,907

Claims priority, application Sweden, Nov. 30, 1973, 7316192

Int. Cl.² A01B *23/02, 23/04, 19/02*

U.S. Cl. 172—688 **6 Claims**



1. Harrow tooth for spring harrows comprising an elongated generally trapezoidally shaped member having a central section of semicircular form and two leaf-shaped parts extending in opposite directions from said central section and being the mirror image of one another, the leaf-shaped parts being angularly offset to one side of a transverse plane through said central section so that they project forwardly in the running direction of the harrow, the side edges of each leaf-shaped part being twisted about its longitudinal axis and the outer transverse edge of each leaf-shaped part defining an angle of less than 90° with one of its side edges and an angle of greater than 90° with its other side edge.

6. An assembly comprising a plurality of harrow teeth as claimed in claim 4 arranged in rows wherein every second row is oriented in a predetermined manner to balance the side oriented forces acting on the teeth during operation.

3,926,262

PIGGYBACK MOGUL GRADER

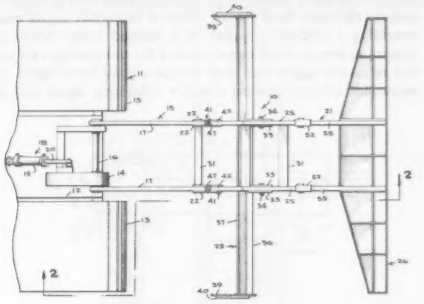
Merle H. Brooks, Star Rte., Stevens Pass Ski Area, Leavenworth, Wash. 98826

Filed May 7, 1974, Ser. No. 467,813

Int. Cl.² E02F *3/12*

U.S. Cl. 172—780 **2 Claims**

1. In a piggyback mogul grader, a vehicle including a body portion having a reversing mechanism thereon, a boom connected to said reversing mechanism and said boom including a pair of spaced parallel side members, plates secured to said side members, a frame including a pair of spaced parallel arms pivotally connected to said plates, a compactor mounted on the outer ends of said arms, blade depth adjustment control members on said frame, a grader unit connected to said frame including a pair of spaced parallel support members connected to said arms, a pair of mounting members adjustably connected to said support members, said grader unit including a blade having a stiffener extending longitudinally across the rear surface thereof, end plates on the ends of said grader blade, a cutting bit on the lower edge of the grader blade, and



ribs on the outer surfaces of the last named end plates providing stiffeners.

3,926,263

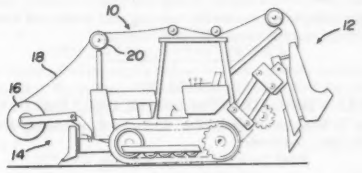
POWER TILT DOZER AND REEL CARRIER

Claude M. Frisbee, and John M. Baylor, both of Bettendorf, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed June 6, 1974, Ser. No. 477,120

Int. Cl.² E02F *3/76*

U.S. Cl. 172—801 **14 Claims**



1. A bulldozing and reel carrier assembly for a bulldozer, or the like, said bulldozer having a bulldozing blade mounted across the front of a U-shaped push frame assembly, means for tilting said blade about an axis parallel to the longitudinal axis of said bulldozer and means for raising and lowering said frame, wherein the improvement comprises:

a pair of parallel, spaced support arms mounted on said push frame adjacent the blade, said arms projecting upwardly and forwardly from said push frame to overly the blade;

a support beam mounted between the pair of support arms vertically above said bulldozing blade; and

a pair of spaced parallel reel support arms rigidly connected to said support beam and extending forwardly from said bulldozing blade to support a cable reel, or the like, ahead of and above said blade to enable simultaneous bulldozing and cable dispensing.

3,926,264

CONTROL CIRCUIT FOR A POWER TOOL

Francis G. Bardwell, Elmhurst, and Edmund C. Dudek, St. Charles, both of Ill., assignors to Thor Power Tool Company, Aurora, Ill.

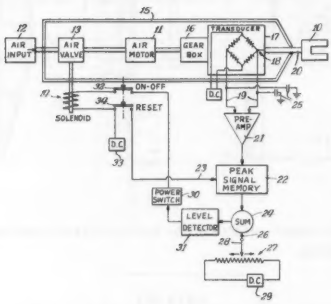
Filed Nov. 23, 1973, Ser. No. 418,762

Int. Cl.² B25B *23/14*

U.S. Cl. 173—12 **8 Claims**

1. A handheld torque applying power tool, comprising a power output shaft, a drive motor connected to said shaft,

means for sensing the torque output of said shaft and for providing a torque signal having a characteristic which represents the torque output level, means for providing a maximum torque reference level signal, reactive reference signal means providing a reference signal of a desired value below said maximum torque level signal, means for comparing said reactive reference signal and said



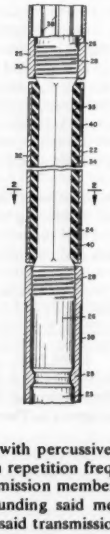
torque level signal being operable to turn said motor on and off a plurality of times until the maximum torque is achieved, means for comparing said torque signal and said maximum torque reference signal and providing an output signal when said maximum outut torque level is attained, and motor control switch means connected to control energization of said motor, said switch means being responsive to said maximum torque comparing means for turning said motor off when said maximum output torque level is attained.

3,926,265

DRILL STEEL FOR PERCUSSIVE DRILLING DEVICES

John V. Bouyoucos, Brighton, N.Y., assignor to Hydroacoustics, Inc., Rochester, N.Y.

Filed June 10, 1974, Ser. No. 477,738
Int. Cl.[2] E21C 7/00; E21B 17/00
U.S. Cl. 173—80 **29 Claims**



1. Drill steel for use with percussive tools which generate force pulses at a certain repetition frequency comprising:

a. a force pulse transmission member,

b. a sheathing surrounding said member, said sheathing being spaced from said transmission member to define a chamber separating said member from said sheathing, and

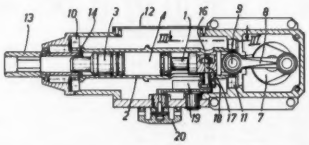
c. means in said chamber connecting said sheathing and said transmission member to cause said sheathing to have a resonant frequency for motion of said sheathing in the direction of force pulse transmission along said transmission member which resonant frequency is below the force pulse transmission frequency whereby said sheathing is dynamically isolated from said transmission member, said means comprising a resilient member of elastic material located in said chamber and connecting said sheathing and said transmission member, said sheathing having a certain mass and said resilient member having a certain compliance related to the mass of said sheathing together to constitute a mass spring system which is resonant at said resonant frequency.

3,926,266

ELECTROPNEUMATIC HAMMER

Roger Dorgnon, Saint-Peray, France, assignor to Societe de Prospection et d'Inventions Techniques SPIT, Bourg-les-Valence, France

Filed July 30, 1974, Ser. No. 493,660
Claims priority, application France, Aug. 10, 1973, 73.29404
Int. Cl.[2] B25D 9/04
U.S. Cl. 173—110 **10 Claims**



1. An electropneumatic hammer of the type including a rotatable sleeve member having an axis, a driving piston mounted in said sleeve member for reciprocating movement along the axis of the sleeve member, an electric motor for effecting the reciprocating movement, a tool-holder spindle, and a striking piston mounted in said sleeve member and driven by said driving piston, the striking piston being disposed in such a manner as to impart a strike to a tool mounted in the tool-holder spindle, the improvement comprising:

means for causing reciprocal rotational movement of said sleeve member about its axis upon reciprocation of said driving piston in a direction parallel to the axis of said sleeve member,

means for causing reciprocal rotational movement of said driving piston about the axis of said sleeve member upon the reciprocating movement of said driving piston which can add to or subtract from the reciprocal rotational movement of the sleeve member imparted to it by the reciprocation of the driving piston, and

means for translating the reciprocal rotational movements of the sleeve member into unidirectional rotation of the toolholder spindle.

3,926,267

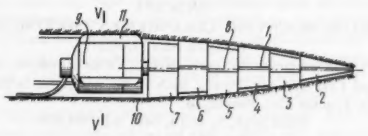
DEVICE FOR DRIVING HOLES IN THE GROUND

Valentin Konstantinovich Svirschevsky, Krasny prospekt, 98, kv. 103; Anatoly Alexandrovich Orekhov, ulitsa Zorge, 257, kv. 13; Boris Grigorievich Tregubov, ulitsa Cheljuskintsev, 44, kv. 37, and Andrei Alexeevich Trofimuk, ulitsa Zolotodolinskaya, 87, all of Novosibirsk, U.S.S.R.

Filed July 31, 1974, Ser. No. 493,733
Int. Cl.[2] E21B 11/02
U.S. Cl. 175—19 **8 Claims**

1. A device for rolling holes in the ground and said device having a longitudinal axis comprising: a crankshaft; substantially tapered rollers having a smooth surface, said tapered

rollers being essentially the transverse parts of a conically-shaped body and mounted in succession on said crankshaft; said tapered rollers having axes, the axes of the tapered rollers being arranged at an angle to the longitudinal axis of the



device and disposed in planes essentially parallel to the longitudinal axis; and a drive having a casing, said drive imparting rotary motion to the crankshaft and axially displacing the device in the hole.

3,926,268

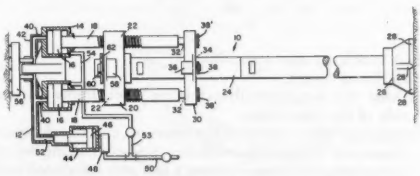
METHOD OF BORING ROCK

William D. Coski, Seattle, Wash., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 19, 1975, Ser. No. 550,931

Int. Cl.² E21B *7/00, 19/08*

U.S. Cl. 175—62 **9 Claims**



9. A method of boring rock along an axis, comprising the steps of:

positioning rock cutter means in contacting engagement with a surface of rock; and

applying only an axially-directed thrust force to said rock cutter means, to cause localized failure to said surface; wherein

said force-applying step comprises applying a force taken from a range of from one-half million pounds to three million pounds of thrust to said rock cutter means.

3,926,269

METHOD AND APPARATUS FOR EARTH BORING

Ray H. Cullen, and Jimmie R. Aker, both of Houston, Tex., assignors to Roy H. Cullen Research, Houston, Tex.

Filed Mar. 7, 1974, Ser. No. 448,975

Int. Cl.² E21B *7/00, 3/10*

U.S. Cl. 175—104 **34 Claims**

1. Apparatus for earth boring with a rotary drilling rig, including:

a drilling string supported by the drilling rig and having a longitudinal bore formed therethrough to enable desired circulation of drilling fluids;

a rotary drilling bit mounted on a lower end of said drilling string for penetrating earth formations when rotated;

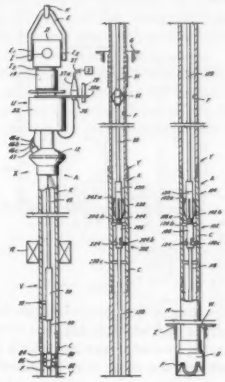
motor means mounted with said drilling string and operably connected with said drilling bit to effect desired earth formation penetrating rotation of the drilling bit when electrical power is supplied to said motor means;

electrical power conductor means disposed in said bore of said drilling string for communicating electrical power to said motor means;

means for providing controllable electrical power disposed exteriorly of said drilling string;

means associated with said drilling string for electrically disconnecting and connecting said electrical power conductor means with said means for providing controllable electrical power, said means for electrically disconnecting and connecting having a member movable in said bore of said drilling string for effecting electrical disconnection and connection with said electrical power conductor means positioned in said bore; and

means for moving said member to effect said electrical disconnection and connection.



3,926,270

FORCE MEASURING DEVICE

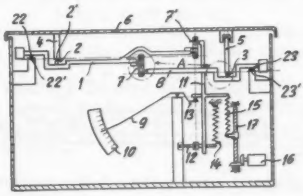
Johann Meier, Brione sopra Minusio, Switzerland, assignor to Precisa AG Rechenmaschinenfabrik, Zurich, Switzerland

Filed Aug. 12, 1974, Ser. No. 496,846

Claims priority, application Switzerland, Aug. 14, 1973, 11665/73

Int. Cl.² G01G *1/18*

U.S. Cl. 177—251 **6 Claims**



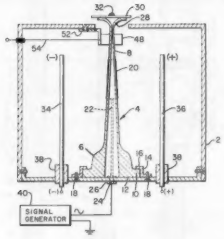
1. A force measuring device in which a force to be measured is transmitted from a measuring position to an indicating device to be displayed thereon, said measuring device comprising: leverage means operably responsive to the force to be measured applied thereto at said measuring position, said leverage means including at least two levers coupled to said indicating device; coupling means for interconnecting said levers, said coupling means having two adjacently disposed end members which are respectively adjustably mounted on said levers at the point of interconnection therebetween for longitudinal movement relative thereto, and housing means provided with a grooved recess for flexibly and securely accomodating said adjustable end members therein, said two levers being orthogonal to the plane of said grooved recess, and said end members being located in said plane.

3,926,271

MICROBALANCE

Harvey Patashnick, Albany, N.Y., assignor to Georg Ruprecht, Englewood, Calif., a part interest

Filed Feb. 3, 1975, Ser. No. 546,273
Int. Cl.² G01G *3/14*
U.S. Cl. 177—210 **21 Claims**



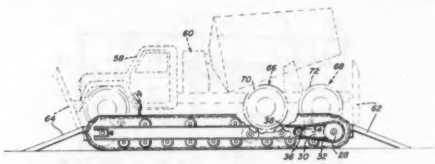
18. A mass measuring device comprising an elongate elastic element having a first end which is adapted to support a mass to be measured and a second larger end which is anchored so that said first end and the mass carried thereby are free to oscillate, said element being tapered from said second end to said first end in a predetermined manner so that said element will have a substantially constant curvature when it is flexed dynamically relative to said second end, drive means for dynamically flexing said element so that its said first end will oscillate at a resonant frequency, and means for sensing the resonant frequency of oscillation of said element with and without said mass, whereby the magnitude of said mass can be determined by measuring the difference in the resonant frequency of said element with and without said mass.

3,926,272

CRAWLER TRACK EQUIPPED VEHICLE PALLET WITH WHEEL SUPPORT DRIVE ROLLERS

Alman A. Weber, 14926 Broadgreen, Houston, Tex. 77024

Filed Oct. 30, 1974, Ser. No. 519,284
Int. Cl.² B62D *55/08*
U.S. Cl. 180—1 C **8 Claims**



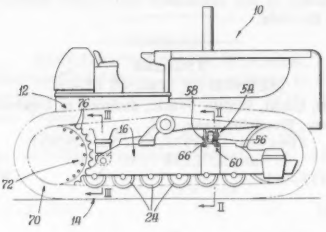
1. An elongated vehicle pallet including opposite side longitudinally arranged crawler track assemblies for support of said pallet from a soft ground surface, said pallet including at least one pair of opposite side sets of journaled transverse rollers with each set of rollers including a pair of transverse rollers spaced apart longitudinally of said pallet and defining an upwardly opening cradle recess for cradling the lower peripheral portions of an associated drive wheel therein with said drive wheel supported from and disposed in driving engagement with said rollers, means drivingly connecting at least one roller of each set of rollers to the corresponding crawler track assembly, said crawler track assemblies each having an independently operable brake assembly operatively associated therewith, said pallet including upper surface portions adapted to support a wheeled vehicle therefrom including a pair of opposite side drive wheel assemblies driven from a differential assembly and with said drive wheel assemblies cradled by said sets of rollers and, said brake assemblies including hydraulic cylinder actuators each operatively connected to the corresponding brake assembly by means of a flexible hydraulic hose for portability of said actuators and to enable the latter to be supported in the operator's cab of a wheeled vehicle supported on said pallet.

3,926,273

TRACK MOUNTING ARRANGEMENT HAVING DUAL GAUGE SETTINGS

Gary D. Blomstrom, Waverly, Nebr.; Victor Randour, Aurora, and Lyle E. York, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 9, 1974, Ser. No. 504,054
Int. Cl.² B62D *55/00*
U.S. Cl. 180—9.48 **12 Claims**



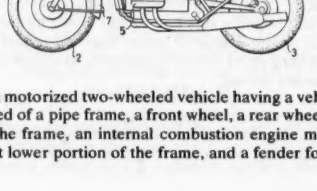
1. A crawler tractor comprising:
main frame means;
at least one longitudinally-extending track frame on one side of the main frame;
connecting means between the rearward end of said track frame and the main frame means, said connecting means comprising a member defining a first arm associated with said track frame, said member further comprising a remaining arm associated with the main frame means, the member being movable to a first position wherein the first arm defines a first position of the rearward end of the track frame laterally of the main frame means, the member being movable to a second position to determine a second position of the rearward end of the track frame generally laterally of the first-defined position of the rearward end of the track frame.

3,926,274

FUEL TANK APPARATUS FOR A MOTORIZED TWO-WHEELED VEHICLE

Minoru Morioka, Niiza, and Tetuo Mikami, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1974, Ser. No. 519,698
Claims priority, application Japan, Nov. 2, 1973, 48-122716
Int. Cl.² B62D *63/04*
U.S. Cl. 180—35 **6 Claims**



1. In a motorized two-wheeled vehicle having a vehicle body composed of a pipe frame, a front wheel, a rear wheel, driver's seat in the frame, an internal combustion engine mounted at the front lower portion of the frame, and a fender for the rear

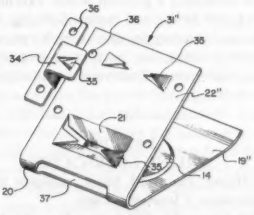
wheel at the rear portion of the frame, an improvement wherein a fuel tank is mounted on said body, said pipe frame, seat, engine and fender defining a substantially enclosed chamber in which said fuel tank is fixedly secured, said fuel tank having a shape substantially conforming to the shape of said chamber; said pipe frame comprising a pair of left and right side frames having a space therebetween, said chamber being defined within said space, support means mounting said fuel tank from said side frames, said support means comprising a pair of spaced brackets secured to said side frames, and means suspending said fuel tank from said brackets, said fuel tank having a concavity therein at the front thereof, and resilient means supported from said side frames and engaged in said concavity.

3,926,275

ACCELERATOR PEDAL SNAP ACTING SIGNALING DEVICE FOR ESTABLISHING A PREDETERMINED FORCE-DISTANCE CHARACTERISTIC

Leonard S. Nersesian, 7138 Scarborough Peak Drive, Canoga Park, Calif. 91304

Filed June 24, 1974, Ser. No. 482,369
Int. Cl.[2] G05G *01/14*; B60K *31/00*
U.S. Cl. 180—77 R **18 Claims**



1. A device for establishing a predetermined force-distance characteristic for an accelerator pedal, said device comprising:

an elastic member shaped so as to have a first force-distance characteristic at relatively short distances, and a second force-distance characteristic at relatively long distances, said characteristics defined graphically by applied force as an ordinate and distance of movement as an abscissa, the slope of said first characteristic being substantially greater than that of said second characteristic, said member including means exhibiting a snap action from said first characteristic to said second characteristic at a predetermined distance of movement, the ratio of applied force to corresponding distance of movement being within the elastic limit of said member; and

mounting means for mounting said elastic member in relation to said accelerator pedal, whereby movement of said pedal in the direction of increased acceleration increases an applied force applied to said elastic member to effect said snap action.

3,926,276

FIVE MAN MINE PERSONNEL CARRIER

Gerald Bruce Sien, Carlsbad, N. Mex., assignor to Sien Equipment Company, Carlsbad, N. Mex.

Filed June 6, 1974, Ser. No. 476,917
Int. Cl.[2] B62D *47/00*
U.S. Cl. 180—89 R **10 Claims**

1. A mine personnel carrier comprising:

a frame;

an engine mounted on the frame;

transmission means mounted on the frame behind the engine and operatively connected thereto;

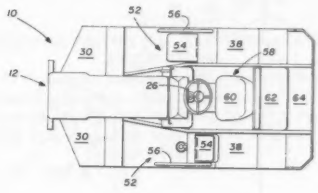
a pair of front steering wheels mounted on opposite sides of the front end of the frame;

a pair of rear drive wheels mounted on opposite sides of the rear end of the frame and operatively connected to the engine through the transmission means to propel the vehicle;

a pair of front fenders mounted on the frame and each extending over one of the front steering wheels;

a pair of rear fenders mounted on the frame and extending over the rear wheels;

a pair of normally generally horizontally disposed members mounted on opposite sides of the frame and each extending between the rear end of one of the front fenders and the front end of the corresponding rear fender;



seat means mounted over the transmission means to define an operator's compartment including means for manipulating the front wheels to effect steering of the vehicle, means for regulating the operation of the engine, and means for regulating the operation of the transmission means; and

seat means mounted on the front portion of each rear fender whereby personnel may be transported on each side of the vehicle in the area extending over the horizontally disposed members between the front and rear fenders;

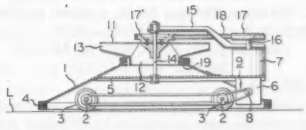
the areas extending between the seat means and the front fenders and over the horizontally disposed members being open to receive the legs of personnel sitting on the seat means and facing forwardly.

3,926,277

VEHICLE DRAWN BY SUCTION AGAINST THE SURFACE OF TRAVEL

Makoto Shino, Asaka, and Mitsuo Saito, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1974, Ser. No. 463,377
Claims priority, application Japan, Apr. 25, 1973, 48-46073
Int. Cl.[2] B60B *37/00*
U.S. Cl. 180—115 **4 Claims**



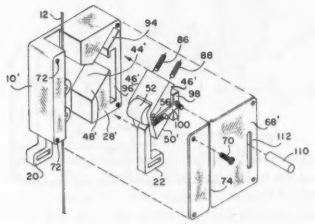
1. A vehicle comprising a hollow body of truncated cone formed to define an interior space, with an opening at the bottom; a plurality of travelling wheels suspended on said body; a labyrinth packing extending downwardly from the bottom peripheral edge of said body to near the surface over which the vehicle travels so as to serve the packing function in cooperation therewith; wheel drive means for driving at least one of said travelling wheels; a fan having a suction port opening into said body and a delivery port opening to the atmosphere and operable to reduce the air pressure in said

body; and fan drive means for driving said fan whereby said vehicle can travel freely over a surface with said body held drawn against the surface.

3,926,278
EMERGENCY ESCAPE SLING

Albert E. Molnar, R.R. No. 1, Box 22, Ringtown, Pa. 17967, and William J. Molnar, 5246 N. 2nd St., Phoenix, Ariz. 85012

Filed Jan. 8, 1974, Ser. No. 431,748
Int. Cl. A62b *1/14*; B65h *59/14*
U.S. Cl. 182—7 **24 Claims**



1. In an emergency escape system to permit the emergency egress of occupants from a building of the type including a flexible cable affixed to the building wherein the cable is vertically positioned relative to the building, the combination of

A. a blocking device removably associated with the cable,

1. said blocking device having a fixed body and a floating friction unit vertically movable within the body from a first position to a second position, the first position being above the second position,
2. said body including first means to contact the cable,
3. said floating friction including second means to contact the cable,
4. said fixed body including a first sling connection,
5. said floating friction unit including a second sling connection, whereby the weight of an occupant is applied to the blocking device at the first and second sling connections,
6. the weight of the occupany pulling the floating friction unit to the said second position,
7. the second means being urged into contact with the cable when the floating friction unit is pulled to the second position.

3,926,279
LUBRICATING APPARATUS

George E. Thrasher, Pontiac, Mich., assignor to Master Pneumatic-Detroit, Inc., Sterling Heights, Mich.

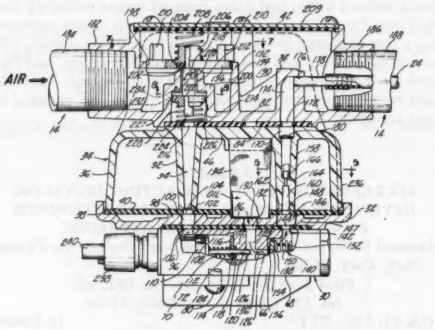
Filed Aug. 30, 1974, Ser. No. 502,203
Int. Cl.² F16N *13/16*
U.S. Cl. 184—29 **30 Claims**

1. In a lubricator having a pump with an inlet and an outlet and being operable upon actuation to deliver a substantially predetermined quantity of lubricant through the outlet, a body which defines a passageway having an inlet and an outlet adapted for respective connection with upstream and downstream portions of an airline, a sensing element in said passageway movable to one position in response to starting of a flow of air in said passageway and being retained in said one position under the influence of said air flow for so long as it continues, and being returnable to another position in response to stopping of the air flow, said passageway having a branch through which pump actuating air is valved in response to each movement of said element to said one position, improved structure which comprises,

a lubricant reservoir having a top, a bottom, and a hollow interior for containing lubricant,

said body being mounted on said top and said pump being mounted on said bottom,

said bottom having a lubricant delivery port which communicates with said pump inlet,



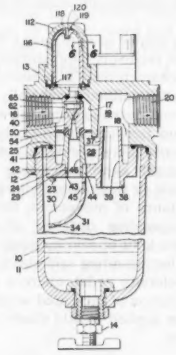
said branch including a portion which extends through the bottom of said body, and means forming a continuation of said branch having portions which extend through the top, hollow interior, and bottom of said reservoir,

said continuation being effective to conduct pump actuating air to said pump.

3,926,280
AIRLINE LUBRICATOR

Robert K. Hoffman, Plainwell, Mich., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed June 21, 1974, Ser. No. 481,497
Int. Cl.² F16N *7/34*
U.S. Cl. 184—55 A **14 Claims**



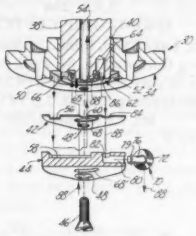
9. An airline lubricator comprising a bowl containing liquid lubricant, a housing attached to the bowl and having an inlet for air and an outlet for mixed air and atomized lubricant, and a main passage that connects the inlet directly to the outlet separately of the bowl, an atomizer nozzle assembly in said passage with internal means for atomizing a portion of the lubricant and for mixing it with a portion of said air, means for delivering a portion of said air and a portion of said lubricant to the interior of said nozzle assembly, and means for discharging said mixed air and atomized lubricant to the interior of said bowl, and additional means forming another passage in said housing connecting the interior of the bowl with said main

passage, said additional means including a tubular portion projecting from a wall of the housing into said main passage and radially spaced from the wall of said main passage to form an annular chamber therebetween that constitutes a portion of said main passage.

3,926,281
COMPRESSOR OIL PUMP WITH FILTER

Billy B. Hannibal, Tecumseh, Mich., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Mar. 21, 1974, Ser. No. 453,279
Int. Cl.[2] F04B *17/00*; F01M *9/00*
U.S. Cl. 184—6.16 **12 Claims**

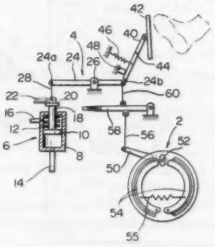


11. An oil pump and filter device for a gas compressor comprising in combination a crankshaft with a lubricating oil passage extending therein from one end thereof to conduct oil for the lubrication of the gas compressor, a sump for lubricating oil disposed adjacent the crankshaft, a centrifugal impeller fixed to said crankshaft for rotation therewith and communicating with both lubricating oil in the sump and said oil passage for discharging lubricating oil drawn from the sump into said oil passage in response to rotation of said impeller by the crankshaft, filter means adapted to receive oil from said impeller and to remove solid contaminants from such oil and retain such solid contaminants while returning filtered oil to said sump, and a valve communicating with said impeller and said filter means and responsive to rotation of said impeller to intermittently bypass a portion of the lubricating oil from said impeller via said filter means to said sump at least once per revolution of said impeller.

3,926,282
EMERGENCY BRAKING SYSTEM

Hiroshi Tanaka, Musashino, and Isao Morita, Tokyo, both of Japan, assignors to Caterpillar Mitsubshi Ltd., Tokyo, Japan

Filed Sept. 16, 1974, Ser. No. 506,398
Claims priority, application Japan, Sept. 19, 1973, 48-108824
Int. Cl.[2] F16D *65/32*
U.S. Cl. 188—106 F **4 Claims**



1. In a vehicle provided with a pressurized hydraulic system, having a brake pedal, a pivotally mounted brake lever associated with said brake pedal and service brakes operatively controlled by depressing said brake pedal and activated by said hydraulic system, an emergency brake system comprising:

separate brake means operable for stopping said vehicle independently of said service brakes;

detector and actuator means connected to the hydraulic system for sensing a loss of pressure in said hydraulic system;

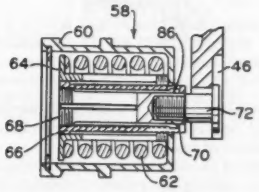
linkage means connecting said separate brake means to said detector and actuator means for operating said separate brake means when said detector and actuator means senses a loss of hydraulic pressure; and

mechanical interlock means associated with said linkage means and operable to prevent application of said separate brake system until said brake pedal is at least partially depressed.

3,926,283
TELESCOPIC PISTON FOR ADDED BRAKE WEAR ADJUSTMENT

Richard L. Crossman, Tallmadge, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Division of Ser. No. 318,882, Dec. 27, 1972, Pat. No. 3,828,894. This application May 6, 1974, Ser. No. 467,396
Int. Cl.[2] F16D *65/54*
U.S. Cl. 188—196 B **8 Claims**



1. A telescopic brake piston return mechanism, contained within a casing, comprising three interengaging tubular members, two such members receivably engaged within immediately larger tubular members, the largest such tubular member being a spring follower receivably engaged with the housing of the return mechanism and the smallest tubular member being adapted to engage the pressure plate of the brake disk stack, the largest and smallest of the tubular members being characterized by the presence of longitudinal slots therein and the other tubular member being a tubular sleeve.

3,926,284
ADJUSTING DEVICE FOR ACTIVATING BRAKE SHOES

Luis Iturriaga Notario, Picos de los Artilleros 160, Moratalaz, Madrid, Spain

Filed June 27, 1974, Ser. No. 483,798
Claims priority, application Spain, July 2, 1973, 193192[U]
Int. Cl.[2] F16D *65/60*
U.S. Cl. 188—196 BA **2 Claims**

1. An automatic adjusting device for automatically adjusting vehicle brakes of the type including a drum, a pair of shoes having lining thereon and moveable against a biasing force into braking contact with said drum, a camshaft having a cam thereon and mounted such that rotation of said camshaft causes said cam to move said shoes into contact with said drum, and a braking drive device operatively connected to said cam shaft for selectively causing rotation thereof; said automatic adjusting device comprising:

at least one ratchet wheel rigidly mounted on said cam shaft;

an activating lever freely rotatably mounted at a first end thereof about said cam shaft and connected at a second end thereof to said braking drive device;

at least one first ratchet cog mounted on said activating lever and radially biased into engagement with teeth of said at least one ratchet wheel, said first ratchet cog comprising means for rotating said ratchet wheel and said camshaft when said activating lever is moved by said braking drive device;

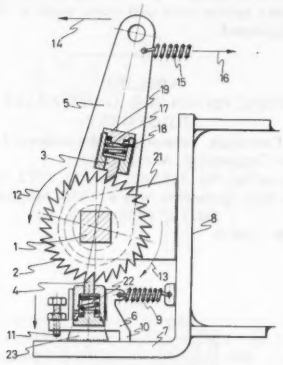
a rocking lever mounted for rotation, adjacent the periphery of said ratchet wheel, about an axis parallel to the axis of said camshaft;

at least one second ratchet cog mounted on said rocking lever and radially biased into engagement with teeth of said ratchet wheel at a position diametrically opposite said first ratchet cog, rotation of said ratchet wheel causing rotation of said rocking lever;

first abutment element means on a first side of said rocking lever for limiting the extent of rotation of said rocking lever in a first direction;

second abutment element means on a second side of said rocking lever for limiting the extent of rotation of said rocking lever in a second direction; and

adjustment means for adjusting the position of at least said second abutment element means.



3,926,285

MOUNTING DEVICE FOR A BRAKE DISK

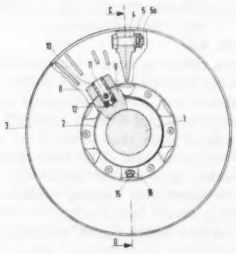
Fritz Preller, and Franz Prahl, both of Munich, Germany, assignors to Knorr-Bremse GmbH, Munich, Germany

Filed Feb. 6, 1975, Ser. No. 547,740

Claims priority, application Germany, Feb. 13, 1974, 7404882

Int. Cl.² F16D *65/12*

U.S. Cl. 188—218 XL **8 Claims**



1. A brake disk for a disk brake for vehicles comprising a hub for mounting on an axle, a brake annular element detachably connected to said hub, said annular element comprising a pair of spaced brake rings with radial cooling ribs therebetween, a plurality of radial extensions on said annular element and there being a radial bore through each said extension, a corresponding plurality of radial extensions on said hub and each hub radial extension having a radial hole therein aligned with a corresponding radial bore in said annular element radial extensions, a threaded nut on the bottom of each said hub radial hole, and a sleeve passing through each said radial bore into an aligned said hole to contact a said nut on the bottom thereof, said nut having a greater outside diameter than the inside diameter of said sleeve.

3,926,286

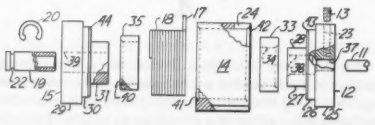
SPRING GRIP CLUTCH

Lee W. Johnson, Lake Elmo, Minn., assignor to Reell Precision Manufacturing Corporation, St. Paul, Minn.

Continuation-in-part of Ser. No. 329,352, Feb. 5, 1973, abandoned. This application Sept. 23, 1974, Ser. No. 508,069

Int. Cl.² F16O *11/06*

U.S. Cl. 192—41 S **6 Claims**



1. A one-way helical spring clutch comprising a tubular shaft or sleeve having an outside and an inside diameter, first and second hub members, each having an axial bore, supported on said shaft in axial alignment and having adjoining peripheral surfaces, and an expandable spring member grippingly encircling said surfaces, one of said hub members being rigidly attached to, and extending axially beyond, said shaft, the axial bore in the extended portion being of approximately the same diameter as the inside diameter of said shaft.

3,926,287

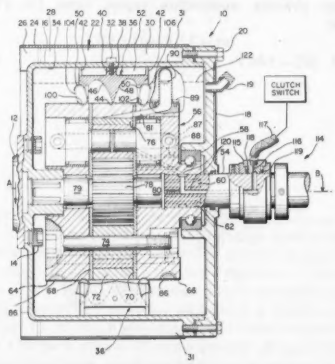
HYDRAULIC TRANSMISSION

Scott V. E. Taylor, 7516 Eton Ave., Canoga Park, Calif. 91302

Filed Aug. 22, 1973, Ser. No. 390,429

Int. Cl.² F16D *31/04*

U.S. Cl. 192—61 **12 Claims**



1. An improved transmission having a rotor supported on a drive shaft, a rotatable rotor casing supporting a driven shaft,

the rotor casing sealably surrounding, coaxial with and spaced from the rotor for containing fluid therebetween, the rotor including gear pump means and fluid inlet and outlet passage means leading to and from the pump means, the improvement comprising:

fluid stream splitter means fixed to the casing interiorly thereof for rotation therewith and for dividing fluid from the pump outlet passage means into first and second components,

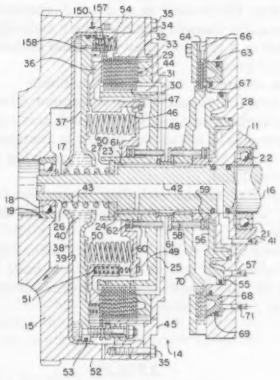
first and second efficiency vane means each comprising a plurality of separate efficiency booster vanes fixed to the rotor circumferentially thereof in adjacently spaced relation from said splitter means on either side thereof and shaped to receive the respective fluid component redirected thereby, capture its energy and transfer it into the rotor, and

fluid scoop means fixed to the rotor extends over the major distance between the rotor and the casing, includes bidirectional fluid intake means, fluid turning means, and communicates with the fluid inlet passage means, said fluid scoop means being axially displaced from said fluid stream splitter means, the fluid inlet passage means being disposed in said rotor at a double acute angle in relation to said pump means.

3,926,288
CENTRIFUGAL CLUTCH WITH OVERSPEED RELIEF VALVE

Karl A. Nerstad, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 3, 1974, Ser. No. 502,828
Int. Cl.² F16D *43/284*
U.S. Cl. 192—104 F **6 Claims**



1. In a clutch for transmitting torque from an engine to the input shaft of a transmission, said clutch including

a rotatable input member having means for connection to said engine and having means defining an annular fluid retaining chamber whereby centrifugal force generates fluid pressure in said chamber which is a function of engine speed and thereby the rate of rotation of said input member,

a driven hub disposed coaxially with respect to said input member and being drivingly coupled to said transmission input shaft,

a clutch pack of annular input clutch plates disposed coaxially with respect to said input member, said pack having at least one driving plate constrained for rotation with said input member and having at least one driven plate constrained for rotation with said driven hub,

an annular pressure plate disposed coaxially with respect to said clutch plates for exerting a force thereon tending to engage said driving and driven plates,

an annular clutch capacity modifying member disposed in said chamber of said input member and exposed to said fluid pressure therein, said input clutch capacity modifying member being movable axially in response to changes of said fluid pressure,

at least one engagement spring acting between said capacity modifying member and said pressure plate for exerting a force on said pressure plate tending to engage said input clutch plates,

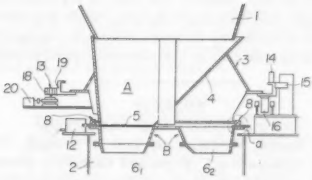
at least one disengagement spring acting on said capacity modifying member in opposition to the force of said fluid pressure thereon whereby said engagement spring is ineffective to engage said input clutch plates until said fluid pressure reaches a first predetermined level, and further including

centrifugal overspeed relief means for automatically disengaging said clutch when engine speed has reached a second, higher predetermined level and for automatically re-engaging said clutch when speed drops below said second level whereby damage due to overspeeding is prevented.

3,926,289
VARIABLE SPEED TURNING CHUTE FOR RAW MATERIAL TO BE DISCHARGED

Kengo Yoshioka, and Teruhiko Shiraishi, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 20, 1973, Ser. No. 426,812
Claims priority, application Japan, Dec. 25, 1972, 48-2665[U]
Int. Cl.² B65G *11/12*
U.S. Cl. 193—23 **9 Claims**



1. A variable speed turning chute for raw materials to be discharged, comprising an upper part rotatable about an axis having means for guiding the raw material therethrough, a rotatable lower part mounted below said upper part and coaxial therewith, said lower part having two outlets formed therein, one of said outlets discharging the raw material guided to it by said means for guiding the raw material, driving means operatively connected to one of said upper and lower parts, and means interconnected between said upper and lower parts for maintaining said parts freely rotatable relative to each other for a predetermined angle and thereafter effecting engagement between said upper and lower parts for rotation thereof in unison so that one of said outlets of said lower part may be selectively aligned with said means for guiding the raw material, whereby raw material of different flow characteristics may be discharged through one of said outlets designed specifically therefor.

3,926,290
LOADING CHUTE FOR CARGO VESSEL

Imao Isojima; Yuzuru Doi, and Shinji Hara, all of Tamanoshi, Japan, assignors to Mitsui Shipbuilding & Engineering Co. Ltd., Tokyo and Kawasaki Steel Corporation, Kobe, both of, Japan

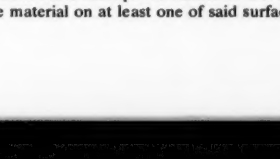
Filed Feb. 27, 1975, Ser. No. 553,691
Claims priority, application Japan, Mar. 4, 1974, 49-25045; Mar. 4, 1974, 49-25046
Int. Cl.² B65G 11/08, 11/14
U.S. Cl. 193—27 3 Claims

1. A loading chute for cargo vessel comprising a telescopically constructed duct which comprises a plurality of unit ducts of successively enlarged horizontal cross sections, the uppermost unit duct being provided with trays which are fixed in said unit duct so as to form a zigzag ladder structure therein, each of the second and other lower unit ducts being respectively provided with trays which are suspended by rope means from the adjacent upper unit duct so as to form a zigzag ladder structure, and each of the second and other lower unit ducts being respectively provided with engaging means at the lower end thereof so that, when a unit duct is retracted over the adjacent upper unit duct, said engaging means engage with the rear portion of each tray located above said engaging means thereby moving said tray in a downward folded position.

3,926,291
CODED TOKEN AND ACCEPTOR

William F. Burke, Westminster; Lee T. Crowell, Whittier; Robert C. Greenwood, Cypress, and Thomas E. Jones, Costa Mesa, all of Calif., assignors to Pan-Nova, Inc., Santa Fe Springs, Calif.

Filed May 6, 1974, Ser. No. 467,088
Int. Cl.² G07F 1/06
U.S. Cl. 194—4 F 15 Claims



1. A coded token for token operated dispensers and the like, comprising:

a disc of electrical insulating material having opposed surfaces;

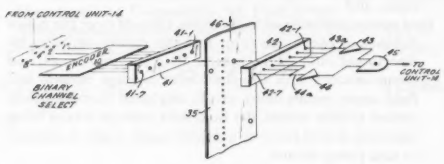
separate concentric and spaced circles of electrically conductive material on at least one of said surfaces; and

an electrical conductor separate from and extending through said insulating material and electrically connecting selected ones of said circles.

3,926,292
FORMAT CONTROL TECHNIQUE AND APPARATUS THEREFOR

Paul S. Ramsden, Jr., Hudson, N.H., assignor to Centronics Data Computer Corporation, Hudson, N.H.

Filed Aug. 22, 1974, Ser. No. 499,633
Int. Cl.² B41J 5/36, 25/00; G06K 7/14
U.S. Cl. 197—1 R 13 Claims



1. Format control apparatus for printers having means for advancing a paper document and printing means movable relative to said paper document, said format control apparatus comprising:

a data storage medium for storing format data words representing the desired printing format, said medium having a plurality of information channels;

said channels being assigned to first and second groups, each format data word being comprised of one and only one data bit located in a selected channel of said first information channel group and one and only one data bit located in a selected channel of said second information channel group;

scanning means for reading said medium;

means coupled to said paper document advancing means for advancing said medium through said scanning means whenever said advancing means is energized; said scanning means including means for receiving a format control command;

said scanning means including means for comparing the code words in said medium with said format control command;

means responsive to said comparing means for terminating said advancing means whenever a code word in said medium passing said scanning means corresponds to said format control command.

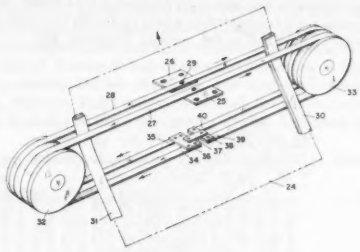
3,926,293
DUAL CARRIAGE IMPACT PRINTER WITH BELT DRIVE

John Erik Ljungberg, Solna, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden

Filed Dec. 19, 1974, Ser. No. 534,363
Int. Cl.² B41J 19/00
U.S. Cl. 197—1 R 5 Claims

1. An impact printing device comprising in combination two spaced carriages provided with printing means, a recording medium passing between said spaced carriages, an elongated driving means for each carriage, means securing the respective driving means to each carriage, said carriages being movable in the length direction of said driving means, said recording means being adapted to be moved incrementally in a direction substantially perpendicular to the direction of movement of said carriages, said drive members being a pair of belts, coupling means interconnecting the free ends of said belts, one of said coupling means being a fixed coupling member interconnecting respective free ends of said belts and the

other coupling means being a yoke interconnecting second respective free ends of said belts, and a link arm connecting



said fixed coupling member and said yoke whereby variations in lengths of the two belts can be compensated for.

3,926,294

CHANGEABLE TYPE HEAD

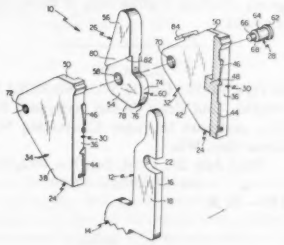
Donald G. Bastian, Homer, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed Oct. 10, 1973, Ser. No. 405,248

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B41J *1/04*

U.S. Cl. 197—36 **7 Claims**



1. In a changeable type head of the type having rear and side walls for enveloping rear and side surfaces, respectively, of a typebar; at least one type character on an exterior surface of the rear wall of the changeable type head; and means for blocking longitudinal movement of the changeable type head on the typebar; the improvement comprising, in combination:

a. a pivot spanning the side walls of the changeable type head, substantially perpendicular to the side walls, and in front of the typebar;

b. a lever on the pivot;

c. a lock surface on the lever, the lock surface farther than a mating front surface of the typebar from the pivot when the typebar is against the rear wall of the changeable type head;

d. a release surface on the lever, the release surface closer than the mating front surface of the typebar to the pivot when the typebar is against the rear wall of the changeable type head; and

e. a handle on an opposite end of the lever from the lock surface for pivoting the lever so that the lock surface faces the typebar to lock the changeable type head on the typebar in cooperation with the blocking means and for pivoting the lever so that the release surface faces the typebar to release the changeable type head from the typebar; and

f. an overcenter surface on the lever, the overcenter surface farther than the lock surface from the pivot and located between the release and lock surface to provide an overcenter effect.

3,926,295

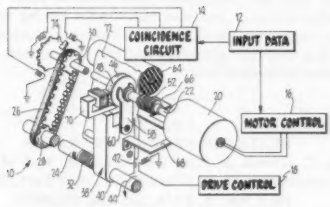
HAMMERLESS IMPACT PRINTER

Carmeli Adahan, Berkeley, Calif., assignor to The Singer Company, New York, N.Y.

Filed July 29, 1974, Ser. No. 492,952

Int. Cl.² B41J *1/32*

U.S. Cl. 197—55 **6 Claims**



1. In a high-speed on-the-fly hammerless impact printing apparatus for printing characters on the surface of a sheet of record media comprising:

a rotatable font wheel having character types disposed on the outer periphery thereof; and

means for continually rotating said font wheel about its axis, said axis being substantially parallel with the surface of the record media;

means for moving said font wheel in a path of travel along said axis while said font wheel is being rotated about said axis;

means for urging said font wheel and selected ones of said character types into printing engagement with said record media and retracting same from said printing engagement while said font wheel is being rotated, about and moved along, said axis;

said last-mentioned means comprising an electromagnet located adjacent said font wheel and acting magnetically on the font wheel itself so as to influence the font wheel away from the record media and means which, upon de-energization of the electromagnet, move the font wheel toward the record media.

3,926,296

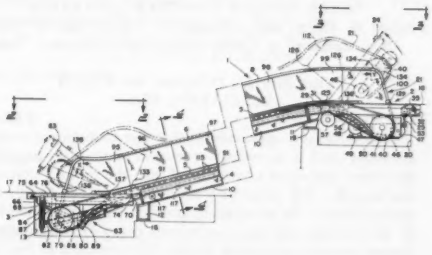
PASSENGER CONVEYOR SYSTEM

Gerald L. Woodling, Akron; John H. Hewitt, Suffield, and Ernest D. Johnson, Tallmadge, all of Ohio, assignors to Westmont Industries, Santa Fe Springs, Calif.

Filed Dec. 7, 1973, Ser. No. 422,675

Int. Cl.² B66B *9/12*

U.S. Cl. 198—16 R **17 Claims**



1. A terminal end assembly for an endless passenger conveyor having a pit with a bottom and sides comprisng an endless belt, a supporting structure hingedly connected at one

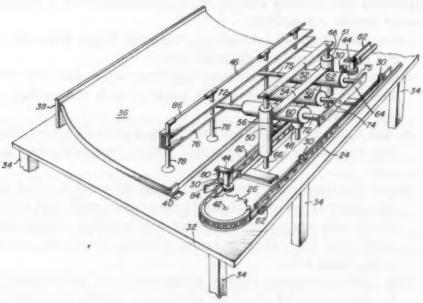
side of said pit for swinging movement of said supporting structure about a horizontal axis, said supporting stucture including a central structural member extending in a generally horizontal position across said pit in the operating condition of said conveyor, end components of said assembly mounted on said central structural member with a least some of said components including a pulley for said belt mounted on the underside of said structural member and extending downwardly into said pit and balustrades mounted on the top side of said structural member at the edges of said belt, said balustrades having handrail guide members for endless handrails movable over said balustrades, said handrail guide members being discontinuous and said balustrades having removable sections to provide clearance for swinging movement of said supporting structure and all of said end components as a unit about said horizontal axis.

3,926,297

PLATE CONVEYING APPARATUS

William C. Guenst, Jr., and Gerold Litschi, both of Ambler, Pa., assignors to W. R. Grace & Co., New York, N.Y.

Filed Apr. 1, 1974, Ser. No. 456,841
Int. Cl.² B23Q 5/22
U.S. Cl. 198—19 **7 Claims**



1. Plate conveying apparatus comprising:
1. a platform;
2. an endless chain with means to drive same on the platform;
3. a plurality of anvils on the chain, each anvil having a top and a vertical shaft with a constricted neck;
4. means to pull a plate over the top of at least two anvils;
5. staker means including a staking pin and means to drive the staking pin down into the anvil shaft and to bring it up again thereby to affix the plate to the anvil for conveying the plate along the platform.

3,926,298

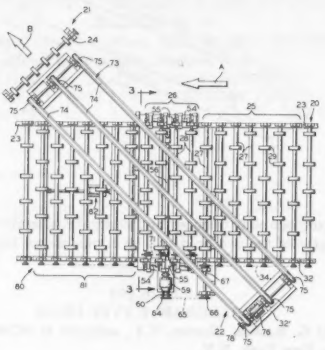
SHEET ARTICLE TRANSFER APPARATUS

Alfred H. Miller, and Lawrence C. Wheat, both of Toledo, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed May 31, 1974, Ser. No. 475,135
Int. Cl.² B65G 47/64
U.S. Cl. 198—20 R **8 Claims**

1. In a transfer apparatus of the type including a primary conveyor and a secondary conveyor extending angularly therefrom and set at a lower level than the primary conveyor and having a first group of longitudinally spaced fixedly supported driven rolls arranged in line with and at the same level as the primary conveyor, a second group of longitudinally spaced movably supported driven rolls arranged in line with and at the same level as said first group of rolls, the rolls of said second group being movable in a substantially vertical direction with respect to the rolls of said first group, a plurality of parallelly spaced driven endless belts arranged between said second group of rolls and in line with and at the same level as the secondary conveyor, the improvement comprising:

a. a number of rotary means corresponding to the number of vertically movable rolls wherein a said rotary means is operatively connected to a said vertically movable roll for moving said roll in the vertical direction, and



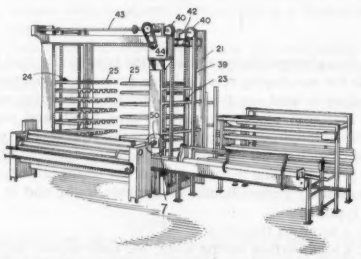
b. a clutch for operating said rotary means one revolution whereby said rotary means simultaneously lower said rolls of said second group below the level of said belt to deposit an article thereon and individually and sequentially raise said rolls of said second group to the level of said first group after the trailing edge of the article has passed therebeyond.

3,926,299

METHOD FOR STORAGE OF WOUND ROLLS OF PAPER

John J. Bradley, and Ernst Daniel Nystrand, both of Green Bay, Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.

Filed July 29, 1974, Ser. No. 492,761
Int. Cl.² B65G 47/00
U.S. Cl. 198—20 R **1 Claim**



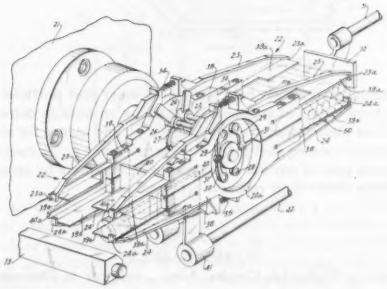
1. A method of log storage comprising advancing logs along a first path toward a log saw system, sensing the system requirements and when no further logs are required, advancing successive logs along a second path generally perpendicular to said first path and in a generally horizontal plane until a predetermined number of logs are accumulated, moving said predetermined number of logs as a group along a generally vertical path, thereafter advancing additional unrequired logs along said first path and continuing the advancement to reach accumulation and vertical movement seriatim until said system requires a log from said first path and thereupon retracting logs in said first path and after the log accumulation therein has been exhausted, reversely moving a group of logs in said vertical path to position the same in said said first path, and continuing the retraction and reverse movement seriatim so long as said system requires a log from said first path.

3,926,300

DEVICE FOR TRANSFERRING BATCHES OF CIGARETTES FROM A FORMATION LINE TO A PACKING LINE FOR THEM TO BE PACKETED

Ariosto Seragnoli, deceased, late of Bologna, Italy; by Leonina Ricci Seragnoli, heir and legal representative, Bologna, Italy; by Giorgio Seragnoli, heir and legal representative, Bologna, Italy, and by Daniela Seragnoli, heir and legal representative, Bologna, Italy, assignors to G.D. Societa in Accomandita Semplice di Enzo Seragnoli e Ariosto Seragnoli, Italy

Filed Dec. 10, 1973, Ser. No. 423,222
Claims priority, application Italy, Mar. 5, 1973, 3346A-73
Int. Cl.² B65G 37/00
U.S. Cl. 198—20 C 6 Claims



1. A device for transferring batches of cigarettes from a conveyor to packaging device, comprising;

a transferring head having an axis of intermittent rotation; first and second guiding strip means, each for guiding a batch of cigarettes, said first and second strip means being secured to said head on mutually opposite sides of said axis and each comprising a first pair of coplanar guiding strips and a second pair of coplanar guiding strips the strips of each first pair being parallel to, symmetrical with and, spaced from the strips of the respective second pair and disposed to enable a batch of cigarettes to be moved into and from position wherein the cigarettes of the batch are generally held between the strips; means for effecting intermittent rotation of the head and of the first and second guiding strip means secured thereto, between a first position wherein the first guiding strip means is disposed for receiving a batch of cigarettes and the second guiding strip means is disposed for releasing a batch of cigarettes, and a second position wherein the second and first guiding strip means are, respectively, so disposed;

a first pusher disposed on one side of said axis, for movement parallel to said axis to push a batch of cigarettes from a conveyor to said position of the batch;

a second pusher disposed on the opposite side of said axis between the several coplanar guiding strips for pushing a batch of cigarettes from said portion thereof; and

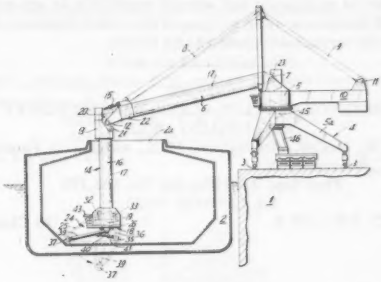
two parallel vertical walls disposed at sides of the latter pusher and of the guiding strip means to move with the latter pusher and thereby to keep the cigarettes in proper positions while the batch of cigarettes is being transferred from the respective guiding strip means to a packaging device.

3,926,301

CONVEYOR ASSEMBLY

Heinrich Herms, Sindorf, Germany, assignor to O & K Orenstein & Koppel Aktiengesellschaft, Germany

Filed Aug. 16, 1974, Ser. No. 498,282
Claims priority, application Germany, Aug. 22, 1973, 2342322
Int. Cl.² B65G 63/00
U.S. Cl. 198—90 6 Claims



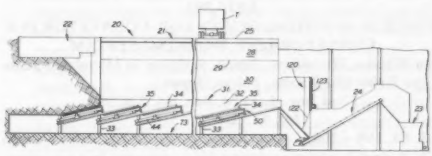
1. A conveyor assembly, comprising a support structure, a first conveyor mounted on said support structure and being positionable in a substantially vertical position, a supporting frame mounted around said first conveyor adjacent the lower end thereof, said frame and said first conveyor being relatively rotatably movable in respect to each other so that there is a relative rotation about the axis of the first conveyor in respect to said frame, a second conveyor comprising a bucket chain conveyor having an endless chain with a plurality of buckets therealong and being carried on said supporting frame and including a lower reach extending laterally of said first conveyor and below said frame, a guide roller for said second conveyor carried by said supporting frame and being located below and on one side of said first conveyor, and a pivot arm rotatably supporting said deflecting roller and pivoted on said supporting frame to extend outwardly from said frame on the opposite side of said frame from said guide roller, said second conveyor chain being guided over said guide roller and said deflecting roller through a path which may be shifted laterally and vertically by adjustment of the angular position of said pivot arm by pivoting said pivot arm, and means on said supporting frame for pivoting said pivot arm, said second conveyor also including an upper portion located above said supporting frame, and a receiving conveyor located on said supporting frame below the upper portion of said second conveyor in a position to receive material from said buckets and to deliver the material to said first conveyor.

3,926,302

MATERIAL HANDLING AND CONVEYING DEVICE

Gordon C. Smith, Richfield, Ohio, assignor to Glaus, Pyle, Schomer, Burns & DeHaven, Inc., Akron, Ohio

Filed Aug. 2, 1973, Ser. No. 385,088
Int. Cl.² B65G 47/18, 25/08
U.S. Cl. 198—53 R 9 Claims



1. In a system for handling refuse material and the like, a pit for storing the material, said pit having an open top, downwardly converging side walls, and a trough meeting said side

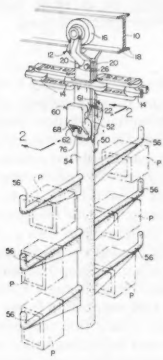
walls at their closest point of convergence; said trough including two generally vertical side plates; columns supporting said side plates; a plurality of adjacent upwardly angled support members each supported by said columns and defining the bottom of said trough; a cylinder mounted on each said support member; a piston and piston rod in each said cylinder; a carriage having wheels riding on each said support member; and pusher means mounted on said carriage and connected to said piston rod for moving material from one said support member to an adjacent said support member in an upwardly angled direction to avoid bridging of the material between the generally vertical side plates of said trough.

3,926,303

CONVEYOR TROLLEY CLEVIS HANGER SAFETY ATTACHMENT DEVICE

John W. McCall, Birmingham, Mich., assignor to Formall, Inc., Warren, Mich.

Filed Sept. 23, 1974, Ser. No. 508,276
Int. Cl.² B65G *17/20*
U.S. Cl. 198—177 R **18 Claims**



1. A parts-carrying safety hanger device for removable securement to an overhead conveyor trolley clevis by a headed clevis pin, said device comprising

a proximal pad portion having

a body,

a bearing opening transversely through said body for the shaft portion of said clevis pin,

and a pair of lugs extending laterally, one from each side of said body,

a rod portion connected to said proximal pad portion and depending therefrom, and having one or more parts-carrying arms connected thereto,

and a pair of safety retaining members movably conjoined to said lugs, one on each side of said proximal pad portion, to overlie the outer ends of said clevis pin when said members are aligned with said proximal pad portion.

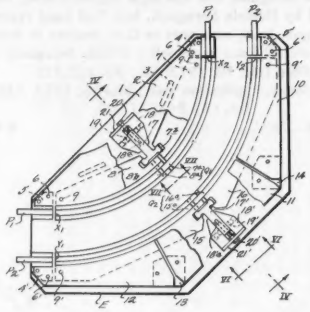
3,926,304

STRETCH ADJUSTING DEVICE FOR A CONVEYOR IN A CONVEYOR-LINE WORKING SYSTEM

Ken Watabe, Hiroshima, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1974, Ser. No. 520,903
Int. Cl.² B65G *15/30*
U.S. Cl. 198—208 **1 Claim**

1. A stretch adjusting device for a conveyor in a conveyor-line working system, characterized in that said device comprises a pair of inside conveyor guide members, which are rotatably pivoted on an inside portion of an upper surface of a corner base at their respective outer end portions, and which have stepwise engaging sections at their respective inner end portions and also have arcuated channels for forming an inside conveyor track on their respective upper surfaces; a pair of outside guide members, which are rotatably pivoted on an outside portion of the upper surface of said corner base at their respective outer end portions, and which have stepwise



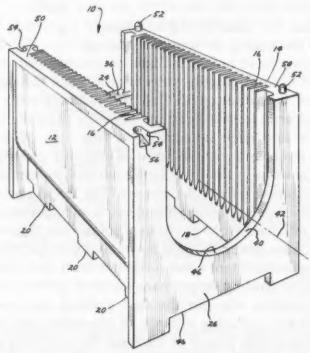
engaging sections at their respective inner end portions and also have arcuated channels for forming an outside conveyor track on their respective upper surfaces; and means for simultaneously rocking said pair of inside conveyor guide members and said pair of outside conveyor guide members by an equal distance about their respective pivotal points.

3,926,305

WAFER BASKET

Victor C. Wallestad, Chaska, Minn., assignor to Fluoroware, Inc., Chaska, Minn.

Filed July 12, 1973, Ser. No. 378,686
Int. Cl.² B65D *1/34*, *85/30*
U.S. Cl. 206—73 **10 Claims**



1. In a wafer basket having opposed side walls adapted to carry axially aligned wafers therebetween, an open top through which wafers may be inserted and ejected and free of obstructions interfering with insertion and ejection of wafers, an open bottom, and end supports joining the side walls at their respective ends,

the improvement wherein one end support joins said side walls adjacent bottom edges thereof and has a horizontal bottom edge and a recessed, upwardly concave, U-shaped upper edge with the bottom-most point of the U-midway between the side walls and below the axis of wafers in the basket to allow endwise access to wafers axially of the wafers, and the other end support comprises a horizontal

bar joining said side walls substantially midway their heights.

3,926,306
METHOD FOR SEALING A FILLED CONTAINER UNDER VACUUM, AND VACUUM-SEALED FILLED CONTAINERS

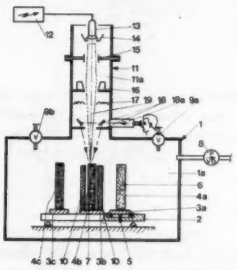
Hans Bertil Van Nederveen, Bosch en Duin, Netherlands, assignor to SKF Industrial Trading and Development Company B.V., Jutphaas, Netherlands

Filed June 15, 1973, Ser. No. 370,513

Claims priority, application Netherlands, June 28, 1972, 7208731

Int. Cl.² B65D *81/00*; B65B *31/02*

U.S. Cl. 206—84 **16 Claims**



1. A closed and sealed container containing a stored material at a pressure less than 10^{-1} torr within said container, the container comprising a plurality of walls which surround and define an enclosure, one of said walls comprising a solid and generally flat outer layer of said stored material fused and sealed to adjacent walls of said remaining walls.

3,926,307
BOTTLE CARRIER

Mindaugas Julius Klygis, Evergreen Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 292,268, Sept. 25, 1972. This application Dec. 12, 1973, Ser. No. 424,060

Int. Cl.² B65D *75/00*, *85/62*

U.S. Cl. 206—153 **5 Claims**

1. A package of a plurality of bottles and a carrier, each of said bottles comprising an enlarged crown portion and a neck portion divering downwardly from said crown portion, said carrier comprising a folded blank of a resilient plastic material arranged to define a pair of elongated downwardly diverging side walls, an elongated bottom wall integrally interconnected between the longitudinally extending lower marginal edges of said side walls, and an elongated top wall integrally interconnected between the longitudinally extending upper marginal edges of said side walls, upper openings formed through said top wall in a longitudinally spaced apart relationship, lower openings formed through said bottom wall in registry with respective ones of said openings in said top wall, said carrier mounted on said plurality of bottles with said lower openings engaging said neck portions of said bottles and said upper openings engaging said neck portions of said bottles immediately below said crown portions of said bottles, and the distance between the junctions of said top wall with said side walls down to the junctions of said side walls with said bottom wall in said package being less than the vertical length dimension of said side walls, said side walls being compressed into convex surfaces which are curvilinear about axes extending longitudinally of said package to resiliently urge said bottom and top walls apart and to resiliently stabilize said bottles in said carrier in a parallel spaced apart relationship.

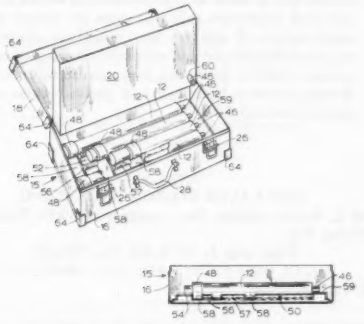
3,926,308
TOOL CARRYING CASE

Lyle L. Sullivan, Olean, N.Y., assignor to Olean Case Corporation, Olean, N.Y.

Filed Feb. 11, 1974, Ser. No. 441,120

Int. Cl.² B65D *85/30*, *85/54*, *25/12*

U.S. Cl. 206—223 **4 Claims**



1. A tool carrying case for accommodating in separately nested relation therein a plurality of electrical fuses of the same or different lengths which include reduced-diameter pressure-vulnerable end portions and enlarged collar portions, and a power line maintenance linesman's tool including fittings for detachable connections to opposite ends of such fuses, one of said fittings having a flexible conductor extending therefrom and terminating in an extended hook portion;

said case comprising an open box-like bottom and sidewalled body portion and a hingedly connected cover portion and a hingedly connected inner tray portion adapted to nest interiorly of said case in predetermined spaced relation between the bottom wall of said body portion and said cover portion;

said bottom wall of said body portion including a plurality of parallel ridge portions defining valleys between each adjacent pair of ridge portions to receive an assortment of such aforesaid fuses in parallel nested relation therein to positionally locate such fuses within said body portion against sidewise dislocations thereof, said bottom wall having an upstanding ledge at one end of said ridge portions to present a transverse abutment surface engaging the ends of said fuses while clearing said end portions thereof and each adjacent pair of ridge portions having transversely aligned interrupted portions presenting channels snugly receiving said collar portions of a particular fuse, said channels being located at fixed distances from said abutment surface whereby said channels and said abutment surface both individually and collectively positionally locate said fuses against longitudinal dislocations thereof, and at least some of said ridge portions having plural channel interruptions therein whereby fuses of different lengths may be accommodated;

said predetermined spacing of said inner tray portion from said bottom wall being selected to cause said inner tray portion to bear downwardly at its bottom surface upon such nested fuses when said tray portion is lowered into

the interior of said body portion and including means for holding said linesman's tool in compactly nested and positionally restrained relation when resting upon the upper surface of said tray portion so as to preclude dislocations of said fuses from their securements within said body portion and/or positional dislocations of said tool relative to said tray portion such as when said case is being in-field carried and/or otherwise handled;

said cover portion being disposed in predetermined spaced relation to said inner tray portion when the cover is closed so as to bear downwardly against said tool when carried by said tray portion and restrain said tool in compactly nested relation upon said tray portion;

said case including releasable latching means for holding said cover portion securely in closed relation to said tray portion and said body portion to maintain said predetermined spacings;

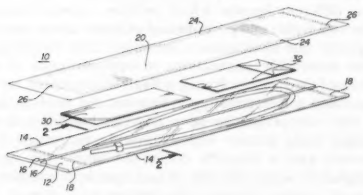
whereby upon placement of one or more fuses within said valley/ridge means said inner tray portion may then be moved into position so as to positionally secure said fuses, and said linesman's tool may then be nested upon the upper surface of said tray portion and said cover portion may then be lowered and releasably secured to said body portion, thereby rendering said case suitable to in-field handling without hazards to said pressure-vulnerable end portions of said fuses.

3,926,309

TWO LAYER STERILE PACKAGING

John L. Center, Dallas, Tex., assignor to Vicra Sterile, Inc., Dallas, Tex.

Filed Aug. 1, 1973, Ser. No. 384,697
Int. Cl. B65d *83/10;* **A61b** *19/02;* **B65d** *31/17*
U.S. Cl. 206—364 **7 Claims**



1. Two layer sterile packaging for separate articles comprising:

a plastic sheet folded along two fold lines generally parallel to the two side edges of the sheet, the folded layers of the sheet being sealed together across each end to form a first pouch to which access may be had between the two side edges of the sheet,

a closure sheet overlying the area in which the two opposite side edges of the plastic sheet are disposed to form a second pouch adjacent the plastic sheet, such closure sheet being sealed to the plastic sheet around a perimeter encompassing at least a portion of said two opposite side edges to complete sealing of the first and second pouches from the atmosphere;

at least one sterile article lying in the first pouch; and

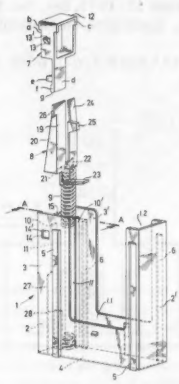
at least one sterile article lying in the second pouch whereby the package may be opened by tearing away the closure sheet so that an article in the second pouch may be readily removed from the second pouch without contacting the interior or side edges of the first pouch, and the contents of the first pouch may thereafter be removed between the adjacent side edges of the first pouch.

3,926,310

CONTAINER FOR 8-TRACK TAPE CARTRIDGES

Peter Ackeret, Kusnacht, Switzerland, assignor to IISI Products AG, Chur, Switzerland

Filed Sept. 19, 1974, Ser. No. 507,336
Claims priority, application Germany, June 5, 1974, 2427108
Int. Cl.² B65D *85/672;* **E05B** *65/46*
U.S. Cl. 206—387 **18 Claims**



1. A cassette storage container comprising:

a housing adapted to receive and store a cassette; ejector means mounted in the housing;

spring means cooperating with said ejector means to bias said ejector means to an ejection position; and

a releasable locking member cooperating with said ejector means to lock said ejector means in an insertion position against the bias of said spring means;

two-movement-allowing mounting and guide means mounting said ejector means for guided movement in the ejection direction and also mounting said ejector means for movement in another manner;

a guide means engaging portion on said ejector means engaging said two-movement-allowing mounting and guide means;

a cassette engaging portion on said ejector means to engage a cassette and move it in the ejection direction;

a mating portion on said ejector means adapted to engage a corresponding mating portion on a correctly inserted cassette by movement of said ejector means in said another manner; and

said locking member cooperating with movement in said another manner of said ejector means to releasably lock said ejector means in the insertion position when said mating portion is engaged and to provide an eject condition when said mating portion is disengaged.

3,926,311

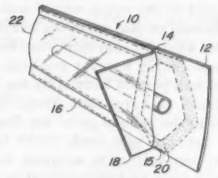
PEEL-SEAL CONTAINERS

Louis Lawrence Laske, Grayslake, Ill., assignor to Vonco Products, Inc., Lake Villa, Ill.

Filed Aug. 22, 1974, Ser. No. 499,621
Int. Cl.² A61B *19/02*
U.S. Cl. 206—439 **7 Claims**

1. A peel-seal container comprising a first layer of uncoated spunbonded olefin material and a second layer of synthetic polymeric thermoplastic material, said two layers being peelably joined together in an area along the longitudinal edges of the said container and across at least one end portion at an area removed from that one end, a peel flap formed at said

one end by said layers overlying each other without being joined together, said first uncoated spunbonded olefin layer having its surface modified in the area of said peelable seal by



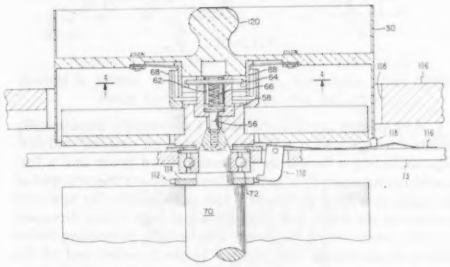
pretreatment with heat and pressure to eliminate the high spots and internal weaknesses to render said sealing area susceptible to having said second layer peelably joined thereto by conventional heat-pressure sealing.

3,926,312

DISK PACK ENCLOSURE

James Francis Elliott, Rochester, and Joel Swenum Johnson, Millville, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 9, 1974, Ser. No. 504,398
Int. Cl.² B65D *85/02*; G11B *1/02*
U.S. Cl. 206—444 **5 Claims**



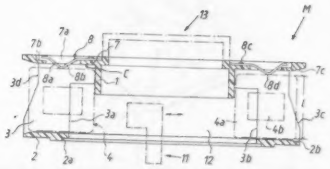
1. In combination, a magnetic disk support means for holding a plurality of magnetic disks in the form of a stack, a screw carried by and having a nonrotatable connection with said disk support means and adapted to be screwed into a threaded opening in the end of a disk stack drive shaft, a cover for covering the stack of disks, and connecting means connecting said cover and said disk support means whereby the cover is fixed with respect to the disk support means, said connecting means including connection making means of such construction to provide a relatively low torsional force on said screw in the direction tending to unscrew the screw from said threaded opening when said cover is rotated in one direction to affix the cover with respect to said disk support means and including connection breaking means which is of such construction as to break said connection between said cover and said disk support means upon a relatively higher torsional force being applied onto said cover in the direction tending to move said screw farther into said threaded opening.

3,926,313

CIRCULAR MAGAZINE FOR PHOTOGRAPHIC TRANSPARENCIES

Alfred Winkler, Munich, Germany, assignor to Agfa-Gevaert AG, Leverkusen, Germany

Continuation-in-part of Ser. No. 435,995, Jan. 23, 1974, abandoned. This application Apr. 17, 1974, Ser. No. 461,737
Claims priority, application Germany, Apr. 19, 1973, 2320028
Int. Cl.² B65D *85/48*; G03B *23/06*
U.S. Cl. 206—455 **11 Claims**



1. A circular magazine for slides having a predetermined height, comprising an annular top wall; and annular bottom wall coaxial with and axially spaced from said top wall; a plurality of substantially radially extending partitions extending between and being integral with said walls and defining therewith slide-receiving compartments, each of said compartments having an outer open end whose height between said walls equals or slightly exceeds said predetermined height so that the slides are insertable and removable through said outer open ends of the respective compartments, each of said partitions having the shape of an inverted L having one leg extending along said top wall and another leg substantially normal thereto and having an outer edge portion aligned with the outer edge of said bottom wall; and abutment means for limiting the extent of radially inward insertion of slides into the respective compartment.

3,926,314

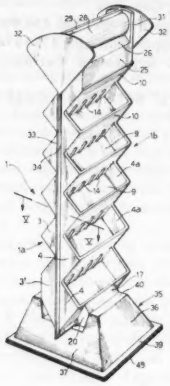
VACUUM MOLDED COLUMN-TYPE DISPLAY DEVICE FOR PARALLELEPIPED-SHAPED OBJECTS

Amilcare Dogliotti, Neive (Cuneo), Italy, assignor to P. Ferrero & C. S.p.A., Alba, Italy

Filed Jan. 28, 1975, Ser. No. 544,743
Claims priority, application Italy, Feb. 8, 1974, 52920/74
Int. Cl.² A47F *5/04*, *7/03*
U.S. Cl. 211—71 **3 Claims**

1. A display device for parallepiped-shaped objects comprising a vertically disposed display column having identical zig-zag shaped side walls and a central portion, the opposite faces of which are formed into a plurality of inclined open recesses adapted to receive groups of parallelepipedic objects disposed adjacent to each other, said column comprising two separate complementary vacuum molded plastic shells having peripheral connecting flanges and means for securing said flanges together, and a vacuum molded plastic supporting base having a molded recess in the upper surface thereof in which the lower end of the vertical column engages in a form-

fitting manner, the molded recess of the base having two opposed teeth adapted to releasably engage in two recesses



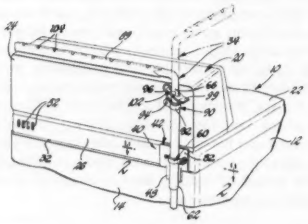
provided on the lower end of the column to stabilize the column with respect to the base.

3,926,315

ADD-ON CLOTHES HANGER FOR APPLIANCE

James A. Bernard, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 10, 1975, Ser. No. 540,155
Int. Cl.[2] A47F 5/08, 7/24
U.S. Cl. 211—102 1 Claim



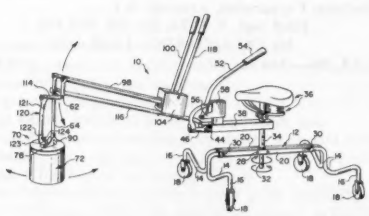
1. A major appliance cabinet, said cabinet including a rear wall portion flush with a rear cabinet panel having a plurality of vertically elongated parallel vent slots therein, bracket means for removably mounting a clothes hanger assembly upon said rear wall portion; said hanger assembly including a vertically extending mounting sleeve member, said bracket means including a mounting plate, means for securing said plate in flush relation with said wall portion, said plate having a pair of vertically elongated slots arranged to coincide with a pair of said wall portion slots defining first and second sets of aligned slots, a strap member closely conforming to a portion of the cross section of said sleeve, said strap having a leg on one end disposed normal to said plate so as to extend through said first set of slots, said strap having a first foot portion extending at right angles outwardly from said leg a defined distance beyond the adjacent second set of slots, a threaded opening in said first foot aligned with said second set of slots, a first threaded fastener extending through said second set of slots into threaded engagement with said first foot opening, said strap having a second foot extending outwardly from its other end in parallel offset relation with said first foot so as to be substantially aligned in the plane of the vertical axis of said sleeve, a threaded receptacle on said plate, a second threaded fastener extending through said second foot into threaded engagement with said receptacle for urging said second foot toward said plate to clamp said sleeve between said strap member and said plate, said hanger assembly including a vertical tube shaped for telescopic reception into said mounting sleeve, said tube including a right angled clothes rack portion located on the upper end of said tube, one-way catch means positioned on said mounting sleeve for releasably gripping said tube whereby said tube may be adjusted to a plurality of vertical clothes hanging positions or a retracted position, and said wall portion formed by the flange of a top deck of said cabinet, said top deck flange having a return flange juxtaposed to the cabinet panel top flange to define a clearance space between said deck return flange and said panel top flange, and said plate securing means including flange fingers struck from said mounting plate at substantially right angles thereto adapted for a press horizontally adjustable fit in the clearance space.

3,926,316

MOBILE SIT-ON TOY CRANE

Argil W. Luttrell, 304 W. Livingston St., Fairbury, Ill. 61739

Filed Feb. 14, 1975, Ser. No. 549,986
Int. Cl.[2] B66C 23/06
U.S. Cl. 212—59 R 9 Claims



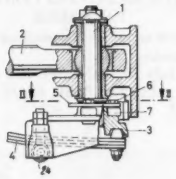
1. A sit-on toy crane comprising a universally directionally mobile carriage which is floor-supported on casters, said carriage including a forwardly projecting fixed beam and a forwardly facing operator's saddle disposed above the rear end of the beam at a level sufficiently low as to enable the operator to straddle the beam and propel the carriage in any direction by foot contact with the floor, a forwardly projecting boom having its proximate end pivoted to the forward end of the beam for swinging movements of the beam in a vertical plane, a boom control lever pivoted to the beam forwardly of said saddle and capable of fore and aft swinging movements, a crank arm on said boom, a link extending between the lever and crank arm for translating the swinging movements of the former into raising and lowering movements of the boom, a dipperstick pivoted adjacent its upper end to the forward end of the boom and depending therefrom in pendulous fashion for fore and aft swinging movements, a dipperstick-operating lever effectively pivoted to the beam adjacent the rear end of the latter and capable of fore and aft swinging movements, a thrust link connecting said latter lever and the dipperstick for translating the swinging movements of such lever into swinging movements of the dipperstick, a pick-up unit carried by the lower end of said dipperstick, a second control lever pivoted to the beam forwardly of said saddle and capable of fore and aft swinging movements, and linkage mechanism connecting said latter lever and pick-up unit and effective to translate the swinging movements of such lever into actuating movements of the pick-up unit.

3,926,317

RAIL VEHICLE DEVICE FOR RETURNING A CENTRAL BUFFER COUPLING HORIZONTALLY TO ITS MID-POSITION

Walter Ernst Gustav Scharfenberg, Salzgitter-Thiede, and Friedrich Wilhelm Günther, Wolfenbuttel, both of Germany, assignors to Scharfenbergkupplung GmbH, Salzgitter, Germany

Filed Apr. 15, 1975, Ser. No. 568,321
Claims priority, application Germany, Apr. 20, 1974, 2419184
Int. Cl.² B61G 7/12
U.S. Cl. 213—20 8 Claims



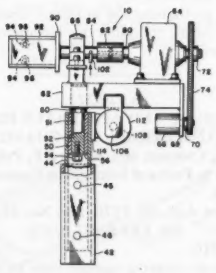
1. A central buffer coupling return device, comprising a fixed housing, a coupling pin journalled in said housing, a coupling rod pivotally connected to said coupling pin, a guide plate pivotal on said coupling pin and having respective opposite side faces, a pair of rollers journalled in said guide plate to project outwardly from each side face, and reaction biasing means acting on said guide rollers on each side including a ram on each side mounted in said housing for sliding movement in directions substantially perpendicular to the axis of said coupling pin, each ram having a first oblique surface applying against said rollers, a second surface guided in said housing, and a third surface forming a lateral biasing surface, and bias means acting on said biasing surface urging said rams in directions toward said coupling pin.

3,926,318

PANEL HANDLING DEVICE AND METHOD

Ronald R. Kister, 7358 Scenic Drive, Ashtabula, Ohio 44004

Filed Apr. 22, 1974, Ser. No. 463,050
Int. Cl.² B66C 1/02
U.S. Cl. 214—1 H 15 Claims



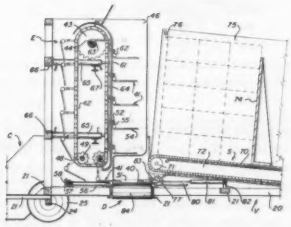
1. A handling device for generally flat structural panels comprising generally horizontally extending separable connecting means on said device for cooperation with connecting means on the panel inwardly of the panel edges for carrying and manipulating the panel with its flat faces extending generally vertically, and power means for rotating said connecting means on said device about a generally horizontal axis for proper orientation of the panel carried thereby, said connecting means on said device comprising a projection having a non-circular cross-sectional shape and said connecting means on said panel comprising a similarly shaped socket having its axis extending substantially perpendicular to the flat panel faces for receiving said projection, and laterally extensible and retractable locking means carried by said projection for releasably locking the panel thereto.

3,926,319

BALE HANDLING APPARATUS

Allan B. Neely, Jr., 12991 E. Nevada, Aurora, Colo. 80010

Continuation-in-part of Ser. No. 335,547, Feb. 26, 1973, Pat. No. 3,817,405. This application June 17, 1974, Ser. No. 479,827
Int. Cl.² A01D 87/12; B65G 57/32
U.S. Cl. 214—6 B 10 Claims



1. Apparatus to load hay bales upon the deck of a vehicle to form a longitudinally extended, horizontally disposed stack which consists of a longitudinal array of transversely disposed, vertical bale tiers, with each tier consisting of a vertical array of transversely disposed bale layers, the loading apparatus, in combination with the vehicle and a bale pick-up means at one side of the vehicle, being located at one end of the vehicle and comprising:

a. a bale-shifting means at the base of the apparatus including a transverse plate means across the vehicle to receive bales from the bale pick-up means and shift the same to form a transversely disposed bale layer upon the plate means;

b. an upright bale elevator above the plate means having a plurality of bale-height spaced, transverse, horizontally-extended, vertically-shiftable, bale-layer-holding groups of tines which will extend, vertically, at least to the height of a bale tier of the stack with the several groups of tines being shifted to be positioned with respect to the vehicle deck so that bale layers carried upon the groups of tines will form a tier at the vehicle deck level;

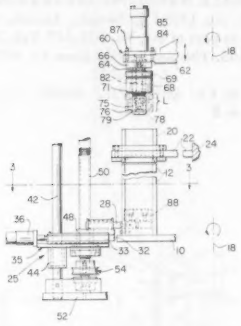
c. a stepper means adapted to move each group of tines from the bottom of the bale elevator first horizontally and longitudinally from one side of the transverse bale holding plate means and underneath a bale layer upon said plate means and then upwardly a distance sufficient to permit another bale layer to be formed on the plate means and thereafter upwardly in a stepped sequence as other groups of tines move across the bale holding plate means; and

d. a pusher means associated with the bale elevator to push a completed bale tier from the elevator and onto the deck when a bale tier is formed by repeated cycles of forming bale layers on the plate means and moving the layers upwardly on the elevator by repeated operation on the stepper means.

3,926,320
APPARATUS AND METHOD FOR SELECTING AND TRANSFERRING A STACK OF LAMINATIONS FOR AN ELECTRIC MOTOR OR THE LIKE

Lawrence A. Shively, and Robert P. Hoy, both of Dayton, Ohio, assignors to Mechaneer, Inc., Dayton, Ohio

Filed June 6, 1974, Ser. No. 477,056
Int. Cl.² B65G *59/02*
U.S. Cl. 214—8.5 C **14 Claims**

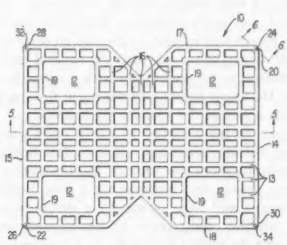


1. Apparatus for selecting a predetermined stack of laminations for a motor or the like, comprising guide means adapted to receive a supply stack of laminations, a pick-off unit positioned adjacent said guide means and including means forming a surface, a pick-off member projecting from said surface and having movable means positioned a predetermined distance from said surface for engaging the supply stack of laminations, means for compressing the supply stack of laminations against said surface with a predetermined pressure, said pick-off unit including means for actuating said pick-off member after the supply stack of laminations is compressed against said surface for retaining a selected stack of compressed laminations on said pick-off unit, and means supporting said pick-off unit for predetermined movement to transfer the selected stack of laminations.

3,926,321
STACKING AID

Lionel F. Trebilcock, 1788 Pleasant Valley Road, Girard, Ohio 44420

Filed May 18, 1973, Ser. No. 361,406
Int. Cl. B65g *1/14*
U.S. Cl. 214—10.5 R **3 Claims**

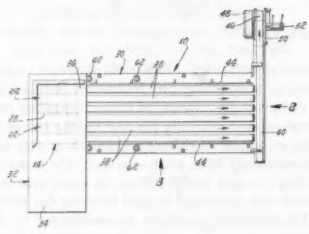


1. A support for stacking cylindrical containers laying on their sides comprised of a framework having a top surface identical to the bottom surface, said framework comprising sidewalls and endwalls, a first plurality of ribs extending between said sidewalls, a second plurality of ribs extending between said endwalls forming openings therebetween, said endwalls, sidewalls, and ribs being molded as an integral unit from a plastic material and having rectangular cross sections with the long axis thereof extending perpendicular to the top and bottom surfaces, and means adjacent each corner defining a rectangular opening substantially larger than the openings between said ribs adapted to receive a portion of the sidewall of a container to maintain the container stationary relative to the support, locking means adjacent each corner thereof for locking a plurality of said supports together when stacked one on top of the other, and said locking means comprises a series of immovable posts and bores alternately positioned around the framework corners.

3,926,322
APPARATUS FOR REMOVING CONTAINERS FROM PACKAGES

Billy Joe Scott, Etiwanda, Calif., assignor to Stewart/Walker Company, LaPalma, Calif.

Filed July 29, 1974, Ser. No. 492,882
Int. Cl.² B65G *65/04*
U.S. Cl. 214—305 **6 Claims**



1. An apparatus for unpackaging containers from a two-portion envelope the two portions of which are hinged together, the containers being disposed in upright positions in two groups respectively within the envelope portions, including:

a. cutting means for making a plurality of cuts thus cutting the two portions of the envelope open on a forward vertical side of the envelope in four cutting zones respectively adjacent the corners of such side and adjacent and on opposite sides of the hinge;

b. means for displacing the groups of containers horizontally in a first direction forwardly through said forward side of the envelope; and

c. means for restraining the envelope against forward displacement during container displacement from said envelope portions.

3,926,323
METHOD OF AND APPARATUS FOR VIAL TRANSFERRING AND CHANGING

Edmund Frank, Chicago, and Edward F. Polic, Lisle, both of Ill., assignors to Packard Instrument Company, Inc., Downers Grove, Ill.

Filed Apr. 10, 1970, Ser. No. 27,406
Int. Cl.² B65G *65/04*
U.S. Cl. 214—310 **14 Claims**

1. A method of indexing sample vials to a predetermined point from a rectangular array of vials disposed in columns and rows along respective X and Y cartesian coordinates, comprising the steps of:

A. indexing the entire array along the X-axis to position one of the rows of vials at a transfer station disposed on a Y-axis coordinate aligned with said point;

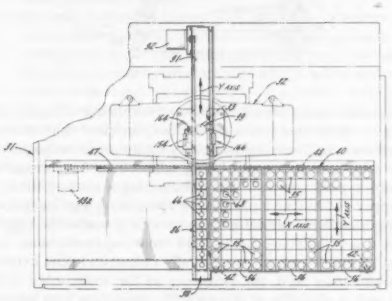
B. indexing each row of vials along a Z-axis to shift said row out of the plane of said array;

C. incrementally indexing each row of vials received in said transfer station from said station along the Y-axis coordinate aligned with said point to successively position, in

seriatim order, each vial in said row at said point; and thereafter

D. again indexing the entire array along the X-axis to position successive rows of the vials in said array in the transfer station in seriatim order after all of the vials in the preceding row have been indexed along the Y-axis to said point.

6. A test sample changing apparatus for use with at least one rectangular array of sample vials disposed in columns and rows along respective X and Y cartesian coordinates of said array and for transferring all of said vials one at a time to a predetermined point, said apparatus comprising, an apparatus frame, means on said frame defining said point, a transfer



station on said frame spaced from said point along a Y-axis coordinate, and means for holding at least one rectangular array of vials on said frame at a location spaced from said station, characterized in that first indexing means are provided for incrementally indexing an entire one of said arrays along the X-axis for sequentially aligning each Y-oriented row of vials with said station, second indexing means are provided for shifting each row of vials aligned with said transfer station along a Z-axis to shift said row of vials out of the plane of said array, third indexing means are provided for incrementally indexing each row of vials aligned with said station along said Y-axis coordinate to sequentially position each vial contained in each said row at said predetermined point in seriatim order.

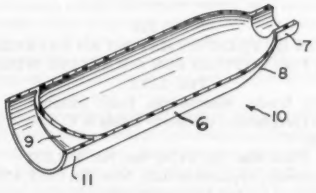
3,926,324
PLASTIC CONTAINER FOR PRESSURIZED LIQUID

Fred J. Zavasnik, Justice, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Continuation of Ser. No. 197,750, Nov. 11, 1971, abandoned. This application May 2, 1974, Ser. No. 466,193

Int. Cl. B65d *23/00*

U.S. Cl. 215—1 C **6 Claims**



1. A hollow article comprising a unitary thermoplastic material free of bonds of a weld type defining a line of juncture and defining:

a. a hollow cylindrical member having a reduced shoulder portion at one end and terminating in a neck portion defining a mouth adapted to receive a closure, and an internally concave projecting closure at the other end of said cylindrical member, said projecting closure being entirely recessed within a cylindrical depending portion of said cylindrical member.

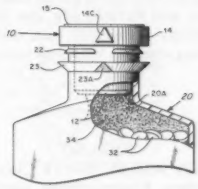
3,926,325
MULTI-POSITIONABLE BOTTLE CLOSURE FOR SELECTIVE SAFETY OR GENERAL USE

Louis Benson, 1075 Old Ford Road, Huntingdon Valley, Pa. 19006

Filed Dec. 11, 1974, Ser. No. 531,624

Int. Cl.² B65D *55/02, 85/56*

U.S. Cl. 215—206 **4 Claims**



1. A multi-positionable closure for a container, the container having an access opening formed thereon, the improvement comprising:

a first cap means on said closure having formed thereon a securing surface for sealingly mating with said access opening;

a second cap means extending from said first cap means having formed thereon a securing surface foor lockingly mating with said access opening;

an elongated gripping surface on said first cap means cooperating with the securing surface on said second cap means by providing leverage capability to assist in unlocking said second cap means from said access opening.

3,926,326
SAFETY CLOSURE

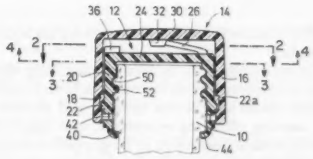
Hermann Grau, Schwabenstrasse 296, 7071 Lindach, Germany

Continuation of Ser. No. 239,565, March 30, 1972. This application June 14, 1974, Ser. No. 479,463

Claims priority, application Germany, Mar. 31, 1971, 2115741

Int. Cl.² B65D *55/02*

U.S. Cl. 215—218 **9 Claims**



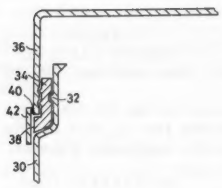
1. A safety closure for containers, comprising an outer cap as a first closure element and an inner cap as a second closure element, for sealing the opening of a container neck, said outer cap being arranged to substantially concentrically encompass the inner cap and further being capable of relative rotary and axial movement with respect to the inner cap, the inner part of the inner cap and the outer part of the container neck being provided with means for mounting the inner cap onto the container neck by relative rotation therebetween in a first direction and for dismounting by relative rotation therebetween in the opposite direction, one of said closure elements having at least one flexible cantilever arm integral

therewith and having a free end contacting the other closure member, the outer and inner caps being provided with first coupling means being engageable by an axial approach of both closure elements against the biasing effect of said at least one flexible arm, and unidirectional second coupling means on the outer and inner caps adapted for positively coupling the outer cap to the inner cap when being rotated in said first direction for sealing the container neck and permitting continuous relative rotation of the outer cap with respect to the inner cap when being rotated in the opposite direction, said second coupling means comprising at least two interengaging stop means for coupling the inner cap to the outer cap when the latter is rotated in said first direction, one of said stop means being provided at the free end of said at least one flexible arm, said flexible arm, said flexible arm also including inclined ramp means slidingly engageable with said stop means for preventing coupling when the outer cap is rotated in the opposite direction.

3,926,327
SAFETY AND SECURITY CLOSURE

Gerhard Schickedanz, Kreuzwertheim, Germany, assignor to Adolf Hofmann Metall- u. Kunstoffwarenfabrik GmbH, Germany

Filed Jan. 23, 1975, Ser. No. 543,357
Claims priority, application Germany, Jan. 26, 1974, 2403826
Int. Cl.² B65D *55/02*
U.S. Cl. 215—218 **9 Claims**



1. A safety closure for a receptacle having an access opening, comprising:

a ring for surrounding the access opening, said ring having means for mounting it on the receptacle so as to be freely rotatable about said access opening and secured against freely moving off of the receptacle, said ring including a gripping surface positioned to be gripped during opening of the closure,

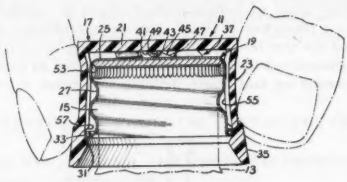
a cap covering said access opening and in screw threaded engagement with said ring such that turning movement of the cap relative to the ring results in removal of the cap from the ring for opening the closure to expose the access opening, said cap also including a gripping surface positioned to be gripped during opening of the closure,

and a sleeve, attaching means for removingly attaching the sleeve to the cap with the sleeve positioned to cover the gripping surface of the ring, whereby removal of the sleeve is necessary to expose the gripping surface of the ring, so that this gripping surface can be gripped along with that of the cap, to effect turning of the cap relative to the ring to open the closure.

3,926,328
SAFETY CLOSURE

David R. Cistone, Lancaster, Pa., assignor to Kerr Glass Manufacturing Corporation, Los Angeles, Calif.

Filed Sept. 28, 1972, Ser. No. 294,833
Int. Cl. B65d *55/02, 85/56;* **A61j** *1/00*
U.S. Cl. 215—220 **5 Claims**



1. A safety closure for a container comprising: an inner cap having an upper end and a generally cylindrical skirt extending downwardly from the periphery of the outer edge of the upper end, said inner cap being adapted to be threadably secured on said container for effectuating a closure thereof, said upper end having a plurality of upstanding lugs located on the upper surface thereof and an outer cap coaxially aligned with and generally overlaying said inner cap, said outer cap having an upper end and a generally cylindrical skirt extending downwardly from the periphery of the outer edge of its upper end, a plurality of downwardly projecting lugs located on the inner surface of said outer cap, said lugs on said inner and outer caps being aligned in a substantially common plane and having substantially vertically extending drive surfaces for abutting and for causing said inner cap and said outer cap to rotate in unison when said outer cap is rotated in a closure direction, said lugs having inclined ramp surfaces for abutting and sliding over each other when said outer cap is rotated in an unlocking direction so that rotation of said outer cap in an unlocking direction does not rotate said inner cap, said lugs on at least one of said caps touching the end wall of said other cap to hold said flat end portion of said outer cap against downward movement, said drive lugs riding over each other to flex said flat end portion upwardly when said outer cap is turned in said reverse direction, cooperable drive surfaces formed on said skirts of said inner and outer caps, said outer cap skirt being made of a resilient material and adapted to be resiliently deformed inward by hand applied compression for causing said drive surface on said outer cap skirt to move from an ineffective position to an effective position for driving engagement with the drive surface on said inner cap skirt, said inner and outer caps rotating in unison when a torque is applied in the unlocking direction and said outer cap skirt is deformed inwardly to said effective position to cause driving engagement between said drive surfaces.

3,926,329
STOPPER OF PLASTICS HAVING AN EXPANSIBLE PORTION FOR BOTTLES FOR SPARKLING WINES AND THE LIKE

Piergiacomo Guala, Alessandria, Italy, assignor to Angelo Guala di Piergiacomo e Roberto Guala & C. S.A.S., Alessandria, Italy

Filed Mar. 26, 1974, Ser. No. 454,892
Claims priority, application Italy, Mar. 28, 1973, 67896/73
Int. Cl.² B65D *39/12*
U.S. Cl. 215—361 **4 Claims**

1. A stopper for bottles of sparkling wine and the like comprising:

a body member,

an actuating member housed within said body member and axially slidable with respect thereto,

a plurality of radially movable inner parts, and means interconnecting said radially movable inner parts to said actu-

ating member such that relative axial movement of said actuating member with respect to said body member in a first direction causes radially outward movement of said movable inner parts thereby causing radial expansion of a part of said stopper whereby to clamp said stopper to the inside of the neck of a bottle when positioned therein, and axial movement of said actuating member with respect to said body member in a second direction permits radially inward movement of said movable inner parts whereby to release said stopper for withdrawal,

said body member is formed as an outer tubular body,

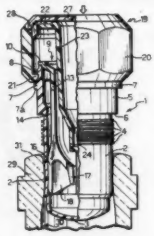
a transverse wall closing the bottom of said tubular body,

a plurality of annular sealing fins extending circumferentially around said body,

said body having an upper part of larger diameter and a lower part of smaller diameter, an annular shoulder separating said upper part from said lower part, said annular shoulder providing an abutment which, when said tubular body is inserted into the neck of a bottle, rests on the mouth of said bottle to define the maximum distance said tubular body can be inserted into said bottle,

upper and lower circumferentially extending, axially separated, annular ridges on said upper part of said tubular body, said lower annular ridge having a larger diameter than said upper annular ridge,

said radially movable inner parts being carried by an intermediate element having an upper part and,



a plurality of strips extending axially downwardly from said upper part, the lower ends of said strips constituting said radially movable inner parts,

said actuating member being formed as a movable member having;

an enlarged head including an annular skirt, said annular skirt surrounding said upper part of said tubular body,

an annular ridge projecting radially inwardly from the lower edge of said skirt, said inwardly directed annular ridge cooperating with said two outwardly directed annular ridges of said tubular body to hold said movable member in position thereon,

an axially extending stem the lower end of which engages said lower ends of said strips of said intermediate element which are so shaped that when said movable member is fully inserted into said tubular body the ends of said strips of said intermediate element are caused to move radially outwardly to clamp said stopper to the inside of the neck of a bottle, when inserted therein, and when said movable member is partly withdrawn from said tubular body, to the limit imposed by engagement of said inwardly directed annular ridge at the bottom of said skirt of said movable member with said lower annular ridge of said tubular body, said strips are free to move radially inwardly to permit extraction of said stopper from the bottle.

3,926,330

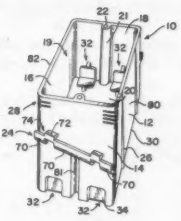
KNOCKOUT ARRANGEMENT FOR MOLDED PLASTIC ELECTRICAL BOXES

Dale R. Deming, and Arthur E. Datschefski, both of South Bend, Ind., assignors to All-Steel Inc., Aurora, Ill.

Filed Mar. 13, 1974, Ser. No. 450,851

Int. Cl.[2] H02G 3/12

U.S. Cl. 220—3.9 **4 Claims**



1. In a plastic molded electrical wiring box for use with a non-metallic, sheathed cable, wherein one end of the cable is to be received in the box, with the box including a side wall structure integrally connected to a back wall, with the side and back wall structures defining a chamber within the box that is open at the front of the box, and the side and back wall structures merging at a marginal corner about the rear of the box, a knockout arrangement therefor through which the cable end is to extend into the box, said knockout arrangement comprising:

a corner segment at said marginal corner comprising a first leaf integral with the side wall structure and a second leaf integral with the back wall structure,

said leaves being integral with each other and being respectively offset within said chamber and inwardly of their respective wall structures and said marginal corners, and being integrally connected to the respective wall structures by marginal portions of film thickness proportions, said leaves merging into each other at their adjacent ends adjacent but spaced from and inwardly of said marginal corner and having their respective opposite ends extend away from their respective adjacent ends,

said leaves being respectively offset within said chamber a distance equivalent to their respective thicknesses minus the thickness of their respective marginal portions,

said marginal portions being integral with each other and defining about said corner segment a marginal edge portion that is continuous and uninterrupted about said corner segment and that is indented into the box and integrally connects said corner segment with said wall structures in a continuous and uninterrupted manner thereabout,

with each corner segment leaf having a tapered molding spline integral with said opposite end of same and with the box wall adjacent same on the inside of the box, with said splines respectively being tapered to increase in thickness in the direction of the respective leaf opposite ends,

said leaves being identical in outline configuration,

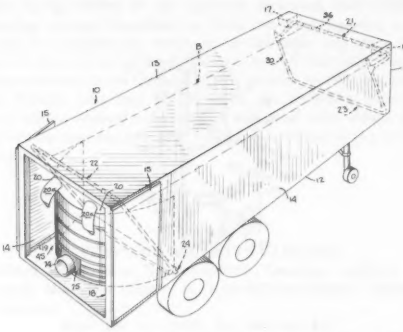
whereby said corner segment as a whole is recessed within the box and is thereby protected from accidental dislodgement, and said corner segment may be removed from the box to form a knockout opening therein by fracturing said marginal edge portion utilizing a hand tool from either inside or outside the box, and the cable end may be inserted into the box chamber through the knockout opening from either the side or the back of the box in normal relation thereto.

3,926,331

LINING OF CONTAINERS FOR BULK CARGO

Ronald W. Bjelland, Valley Stream; Charles A. Narwicz, Greenlawn, both of N.Y., and Casimir Hetmanski, Westfield, N.J., assignors to United States Lines, Inc., New York, N.Y.

Filed Nov. 16, 1973, Ser. No. 416,580
Int. Cl.[2] B65D *25/14*; B65G *65/34*; B60P *1/00*
U.S. Cl. 220—63 R 34 Claims



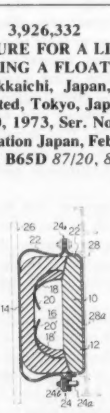
1. In a cargo container of the type having a floor, side walls, a roof, and a front wall, and wherein the roof structure includes downwardly projecting structural members, a liner bag adapting the container for receiving bulk cargo, and means for supporting said liner bag within the container comprising front frame means including a bottom cross member on and extending transversely across the container floor, a pair of substantially parallel side members extending upwardly and rearwardly from the respective ends of said bottom cross member, said side members having upper end portions engaging forwardly facing surface portions on one of said downwardly projecting structural members, and means bracing said side members apart adjacent to their said upper end portions and including a top cross member extending between said side members and generally parallel to said bottom cross member, said liner bag having a transversely extending bottom front end area connected to said front frame bottom cross member and a transversely extending upper front end area connected to said front frame top cross member.

3,926,332

SEALING STRUCTURE FOR A LIQUID STORAGE VESSEL HAVING A FLOATING HEAD

Chikashi Okamoto, Yokkaichi, Japan, assignor to Nippon Kakokicompany, Limited, Tokyo, Japan

Filed Dec. 10, 1973, Ser. No. 423,532
Claims priority, application Japan, Feb. 14, 1973, 48-17497
Int. Cl.[2] B65D *87/20*, *87/18*
U.S. Cl. 220—226 6 Claims



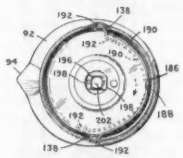
1. A sealing structure for use in a liquid storage vessel having a floating head, said sealing structure comprising a core including an elongated inner core member of elastic material having a substantially rectangular cross section and substantially parallel inner and outer longitudinal surfaces and an elongated outer core member of elastic material having a substantially arcuate cross section projecting outwardly away from the outer longitudinal surface of the inner core member, said outer core member having substantially parallel upper and lower longitudinal ends respectively secured to the upper and lower longitudinal ends of the outer longitudinal surface of the inner core member to form a continuous cavity throughout the length of said core, said outer core member being initially formed separately from said inner core member as a substantially flat elongated strip and being thereafter forcibly deformed into a configuration having said arcuate cross section, and a flexible covering member hermetically enclosing said core therewithin and slidably pressed between the inner longitudinal surface of said inner core member and an outer peripheral surface of said floating head and partly between the projecting outer longitudinal surface of said outer core member and an inner peripheral surface of said liquid storage vessel.

3,926,333

PERCOLATOR TOP FASTENING MEANS

John Littell Eaton, Jr., Delanco, N.J.; Richard Henry Brill, and Walter E. Myers, both of Philadelphia, Pa., assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 451,336, March 18, 1974. This application May 12, 1975, Ser. No. 576,412
Int. Cl.[2] B65D *45/32*
U.S. Cl. 220—320 7 Claims



1. A quick-release latch mechanism for holding the cover of a vessel, comprising:

at least two sockets in the wall of said vessel;

each of said sockets having a horizontal camming surface to provide a camming action upon horizontal movement relative to said horizontal camming surface;

socket engaging means on said cover adapted to engage said sockets in said wall of said vessel;

spring means in said cover urging said socket engaging means against said horizontal camming surface to engage said socket.

3,926,334

COUNTING AND SEGREGATING MECHANISM FOR INDIVIDUAL ARTICLES

Charles E. Brocklehurst, Honea Path, S.C., assignor to Riegel Textile Corporation, New York, N.Y.

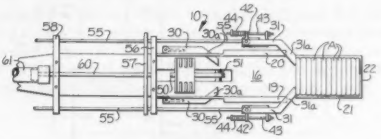
Filed July 24, 1974, Ser. No. 491,389
Int. Cl.[2] B65H *33/10*
U.S. Cl. 221—7 9 Claims

1. A counting and segregating mechanism for individual articles including disposable diapers and the like and characterized by the ability to count and segregate a group of a predetermined number of such articles for packaging and the like; said mechanism comprising:

elongate compartmented means defining sequentially along a horizontally and longitudinally extending path an area for receiving the articles to be counted, an area for receiving the articles from said receiving area and holding

the articles as they are being counted, and an area for receiving a counted group of a predetermined number of the articles from said counting area for removal from said mechanism;

means operatively connnected with said compartmented means for longitudinally and horizontally moving the articles sequentially from said receiving area to said counting area;



means operatively connected with said compartmented means for longitudinally and horizontally moving a counted group of a predetermined number of the articles from said counting area to said removal area; and

control and actuating means connected with both of said moving means for sequentially operating said article moving means a predetermined number of times and then operating said counted group moving means so that a predetermined number of individual articles will be counted and segregated into a group of such articles.

3,926,335

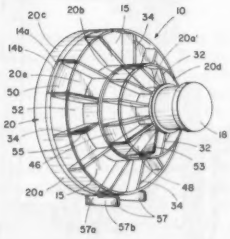
CAPSULE OR PILL DISPENSER-SURE WAY DIAL A PILL

Thomas C. Dangles, and Elsie R. M. Dangles, both of 10424 Lavergne, Oak Lawn, Ill. 60453

Filed Mar. 18, 1974, Ser. No. 451,978

Int. Cl.² G07F *11/00*

U.S. Cl. 221—82 **7 Claims**



1. A pill dispenser comprising:

a base unit having a stepped shaped contour forming a plurality of vertically spaced tiers and said base unit also having a central portion,

a plurality of divider members extending radially from said central portion and forming pill storage compartments on each tier,

dial cover means fitted for rotatable movement over each tier, and the associated storage compartments to thereby prevent unintentional discharge of the contents of each storage compartment, and

each dial cover means including a top pill loading opening and also including a side discharge opening to thereby provide means for loading pills into the compartments upon selected indexing of said rotatable dial cover means, and also to thereby provide means for selectively discharging pills from said compartments, and

said base unit including an annular vertical rim encircling the bottom of the base unit,

pedestal means mounted on said vertical rim and having a support surface means at an acute angle to the base rim surface for mounting said pill dispenser in a generally upright position but at a slight inclination whereby said upper end of the central opening is tilted for holding an associated pill bottle therein with the base rim being generally horizontal but slightly inclined for balancing of the pill dispenser in an on-end position in a generally vertical but slightly inclined to the vertical plane,

said support surface adapted to lie on a horizontal surface and support said base unit in a generally perpendicular relationship to the base unit bottom surface.

3,926,336

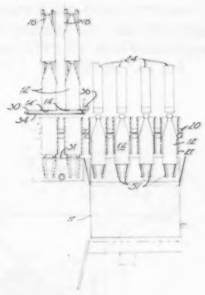
ESCAPEMENT MECHANISM FOR CASE PACKING MACHINES

Robert H. Graham, and Duane Sanders, both of Spokane, Wash., assignors to R. A. Pearson Company, Spokane, Wash.

Filed Apr. 5, 1974, Ser. No. 458,106

Int. Cl.² G07F *11/16*

U.S. Cl. 221—296 **6 Claims**



1. An escapement mechanism for handling articles of equal height in successive groups wherein the articles each include a reduced end and an enlarged end, and are initially stacked vertically one against another with the reduced end of one article engaged against the enlarged end of an adjacent article to form a plurality of elongated columns, the effective height of each article in the columns being equal, said columns being arranged parallel to each other and in a rectangular array to form rectangular groups of articles within a hopper and being urged toward a hopper discharge end, said escapement mechanism comprising:

first abutment means mounted to the hopper for movement between a first position intersecting the article columns and engaging the enlarged end of each article in a rectangular group along a plane located across the hopper discharge end and a second position laterally clear of the article columns, for intermittently permitting single groups of articles to move outward from the hopper discharge end;

first drive means operatively connected to said first abutment means for moving said first abutment means between said first and second positions;

second abutment means in line with said columns and spaced outwardly from the hopper discharge end for receiving and supporting the rectangular groups of articles released by said first abutment means along their enlarged ends and for vertically moving the groups engaged thereby between (a) a first position in line with and intersecting the respective columns wherein said enlarged ends are spaced outwardly from said plane by a distance substantially equal to the effective height of a single article in a column and (b) a second position in line with and intersecting the respective columns wherein the enlarged ends are spaced outward from the plane by a distance greater than the actual height of a single article;

second drive means operatively connected to said second abutment means for moving said second abutment to move successive groups of articles from the first to the second position;

sensing means for detecting engagement of a prescribed number of articles on said second abutment means and operatively communicating with said first drive means to affect movement of the first abutment means upon sensing engagement of a prescribed number of articles on said second abutment means; and

transfer means for moving the groups of articles while they are supported by the second abutment means at the second position along a path to a location laterally clear of the elongated columns.

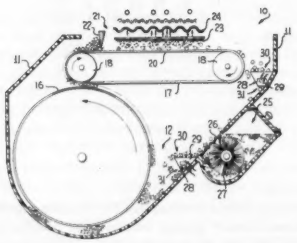
3,926,337
METHOD OF MEASURING CONCENTRATION RATIOS OF A MIXTURE OF MATERIALS

Roger M. O'Neill, Oak Lawn, and John B. Kennedy, Jr., Chicago, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 140,573, May 5, 1971, Pat. No. 3,802,381, which is a continuation of Ser. No. 748,754, July 30, 1968, abandoned. This application Sept. 17, 1973, Ser. No. 397,575

Int. Cl.² B67D *5/14*

U.S. Cl. 222—1 **8 Claims**



7. An electrostatic printing or coating process involving detecting the ratio of larger carrier particles of a first solid material to smaller toner particles of a second solid material which adhere to said carrier particles by triboelectric forces in a mix of carrier and toner particles comprising establishing a field in a predetermined position, accommodating a predetermined volume of said mix in said position while transporting mix through said position, detecting the magnitude of said field within said predetermined volume including detecting variations in said field for determining the ratio of carrier particles to toner particles in said volume, and adding toner particles to said mix prior to introducing said mix into the printing or coating zone, the addition of toner particles being governed in accordance with data derived from said detecting step.

3,926,338
THERMALLY INSENSITIVE PARTICLE CONCENTRATION CONTROLLER

Noel L. Reyner, Hilton, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 5, 1973, Ser. No. 413,108

Int. Cl.² G03G *15/08*

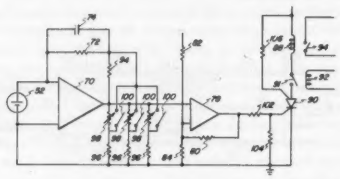
U.S. Cl. 222—56 **14 Claims**

1. An apparatus for controlling the concentration of particles in a mix, including:

electrode means biased electrically to attract particles thereto as said electrode means passes through the mix;

means for illuminating said electrode means having the particles deposited thereon with light rays;

a thermally insensitive photodiode for detecting the intensity of the light rays transmitted from said electrode means, said photodiode being adapted to generate a substantially thermally insensitive electrical output signal indicative of the density of particles deposited on said electrode means; and



amplifying circuit means, in electrical communication with said photodiode, for stably amplifying the thermally insensitive electrical output signal from said photodiode to at least a preselected level.

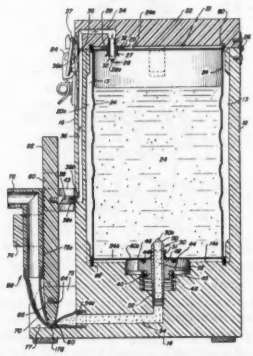
3,926,339
LIQUID DISPENSING APPARATUS HAVING PLURAL CAN PIERCING TOOLS

Richard A. Openchowski, Woodridge, Ill., assignor to National Can Corporation, Chicago, Ill.

Filed June 21, 1974, Ser. No. 481,553

Int. Cl.² B67B *7/26, 7/28*

U.S. Cl. 222—83 **9 Claims**



1. A liquid dispenser unit adapted for use in the gravity dispensing of liquids held with can type containers which comprises:

a. a frame means for holding a can type container in a liquid dispensing situation, said frame comprising a base, front and rear walls and a top hingedly connected to the rear wall;

b. a first can piercing means mounted on the interior surface of said frame base between said front and rear walls and located to pierce the bottom of a container held in said frame, said piercing means having a fluid conducting passageway formed therein;

c. a second can piercing means mounted on the lower surface of the top of said frame located to pierce the top of a container held in the frame when the top is closed, said piercing means having a central passageway formed therein;

d. a valve means mounted on the front wall of said .. ne, including means for simultaneously separately closing and opening first and second valve passageways;

e. a first conduit means between said first valve passageway and said fluid conducting passageway, said first conduit being formed in the base of the frame means;

f. a second conduit means between said second valve passageway and said central passage formed in the front wall and top of the frame means; and

g. a pressure exerting means associated with said first piercing means, said means exerting a positive upward sealing pressure on the bottom of a can held in the frame to effectuate a seal between the said can and first and second piercing means when the top member is closed.

3,926,340

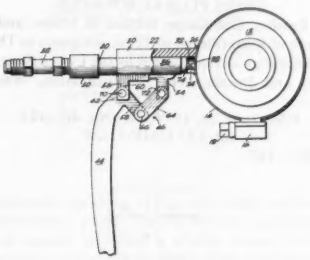
PRESSURIZED CAN PIERCING TOOL

Charles Tygenhof, 212 Curtiss Parkway, Miami Springs, Fla. 33166

Filed Feb. 22, 1974, Ser. No. 444,748

Int. Cl.² B67B *7/24*

U.S. Cl. 222—83.5 **3 Claims**



1. A tool for opening and administering the contents of a pressurized cylindrical can having top, bottom and side walls, said tool comprising, ring means for fitting circumferentially about the can wall between the top and bottom walls and including adjustment means to snugly fit the ring about the can wall, a support member extending radially from one side of and rigidly fixed on the ring means and longitudinally extending guide means on the support member, a piercing sleeve member having a proximal end and a distal end and means slidably captivating said sleeve member on the support member and engaged in the guide means, said sleeve member having a longitudinally extending through bore, a piercing means extending radially from the proximal end of the sleeve member and with a through opening in fluid communication with the through bore, said piercing means being normally spaced radially outwardly of said ring means and adapted to be slidably moved radially inwardly past the ring means and into piercing engagement with the can for providing a flow path for pressurized contents in the can through the piercing means through opening and sleeve;

a lever connected to the sleeve member,

toggle means connecting the lever to the sleeve member and to the support member to releasably lock the piercing means in piercing engagement with the can wall, and nipple means connected to the distal end of said sleeve member for conducting material through the tool when the can has been pierced, said support member comprising a housing having a longitudinally extending passageway therethrough and a longitudinally extending slot means in the housing communicating with said passageway, said sleeve member including a rigid arm projecting intermediately from said sleeve and through said slot means, clevis means integral with said housing and disposed outwardly of said rigid arm of said sleeve member, said clevis means and rigid arm each including pivot portions in substantially longitudinal alignment along the path of movement of said sleeve member in said housing, said toggle means comprising a foot on said lever pivoted on said clevis means and extending angularly away from a line passing through said pivot portions, a link pivotally connected to said foot and the pivot portions of said rigid arm so that movement of said lever away from said ring means causes the sleeve member to move away from said ring means and the foot and link to project angularly away from housing outwardly of the line passing through the pivot portions, and movement of the lever toward the ring means causes the lever and link to pivot inwardly beyond the line passing through said pivot portions when the piercing means projects beyond the inner periphery of said ring means and the can is pierced.

3,926,341

BOTTLES IN SEMI-RIGID PLASTIC MATERIAL

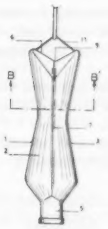
Willy Lhoest, Rixensart, Belgium, assignor to Recherche et Industrie Therapeutiques, Belgium

Filed Nov. 28, 1973, Ser. No. 419,847

Claims priority, application Belgium, Dec. 8, 1972, 125060

Int. Cl.² B65D *35/28*

U.S. Cl. 222—95 **2 Claims**



1. An improved collapsible semi-rigid plastic bottle for containing and dispensing physiological liquids for intravenous administration of the type having four sidewalls joined at their respective ends by two opposed transversal walls to form a base and a narrowing top surface, said top surface containing at least one access device to the inside volume of said bottle, with two opposite sidewalls containing a bellows-shaped groove extending substantially the entire length of said sidewalls and said base also containing a bellows-shaped groove joined at each end to the bellows-shaped grooves of the attached sidewalls such that when under an internal-external pressure differential the remaining two flat sidewalls of said bottle collapse toward each other, wherein the improvement comprises a flexible hanging means oppositely attached to two edges formed by the joining of said base to said flat sidewalls so that, when said bottle is hanging in an inverted position, the weight of said bottle exerts a force on said flexible hanging means which, as a result of the positioning and flexing of said hanging means, materially aids in the collapse of said flat sidewalls.

3,926,342

CARBONATED WATER PRODUCING APPARATUS

Ray E. Selvia, and Allan D. Barden, both of Terre Haute, Ind., assignors to All State Vending Equipment, Inc., Terre Haute, Ind.

Filed Aug. 1, 1974, Ser. No. 493,495

Int. Cl.² B67D *5/62*

U.S. Cl. 222—129.1 **5 Claims**

1. A carbonator comprising:

a sealed first pressure vessel;

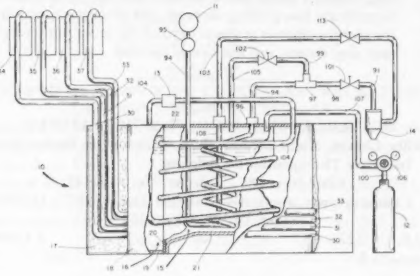
a sealed second pressure vessel containing liquid and said first pressure vessel;

a tap water carrying coiled tube extending into and out of said first pressure vessel being connectable to a source of tap water;

a carbonated water outlet tube extending into said first pressure vessel;

a carbon dioxide carrying tube opening into said first pressure vessel;

a tap water inlet tube connected to said coiled tube and opening into said first pressure vessel;



refrigeration means including a coolant tube extending into said second pressure vessel and adjacent said first pressure vessel operable to cool liquid within said second pressure vessel;

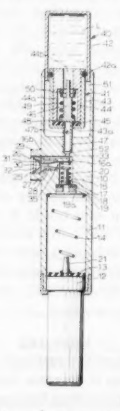
conduit means mounted adjacent and to said second pressure vessel operable to carry syrup adjacent said second pressure vessel; and

insulation surrounding said second pressure vessel and securing said conduit means to said second pressure vessel.

3,926,343
ATOMIZED SPRAY DISPENSER WITH IMPROVED ATOMIZATION

Eduard K. Kleiner, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 26, 1974, Ser. No. 454,917
Int. Cl.[2] B67D *5/54*
U.S. Cl. 222—145 **12 Claims**

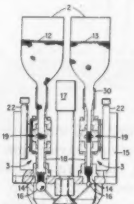


1. A dispenser for dispensing a measured dose of a spray of liquid in finely atomized form in compressed air, comprising a dispenser body having a nozzle means opening out of said dispenser body and having a through passage ending in an outwardly diverging portion, an air compressing piston-cylinder means mounted on said body and having a fixed member and a movable member movable relative to the fixed member through a compression stroke to compress the air, the body having a compressed air flow path therethrough from the air compressing piston-cylinder means to the nozzle means for conducting compressed air from the air compressing piston-cylinder means to the nozzle means, a valve member in the body normally obturating the compressed air flow path, actuating pin means operatively associated with the movable member of the air compressing piston-cylinder means and said valve member for positively actuating the valve member to open the compressed air flow path near the end of the compression stroke when the air compressing piston-cylinder means has compressed air to a predetermined pressure, a liquid product supply means on said dispenser body including means for mechanically pressurizing the liquid product and for dispensing a measured amount of a liquid product under pressure, said dispenser body having a product supply passage extending thereinto from said product supply means and intersecting said compressed air flow path upstream of said nozzle means.

3,926,344
VOLUMETRIC DISPENSER FOR SMALL PARTICLES FROM PLURAL SOURCES

Ronnie A. Bradley, Oak Ridge; William H. Miller, and John D. Sease, both of Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 20, 1974, Ser. No. 481,422
Int. Cl.[2] G01F *11/28*
U.S. Cl. 222—145 **1 Claim**



1. Apparatus for accurately and contemporaneously dispensing measured volumes of a plurality of different small spherical or spheroidal particles from respective supply hoppers into a common receiver comprising:

a. a support frame;

b. a plurality of orifice members defining vertically oriented passageways mounted within and supported by said frame, said passageways terminating in respective discharge ports at the lower ends of said orifice members;

c. ball plug valves respectively engaging said discharge ports;

d. means for simultaneously actuating said ball plug valves to simultaneously open and close said discharge ports;

e. vertically oriented, vertically individually adjustable measuring tubes having lower ends respectively slidably engaging said passageways in said orifice members; said measuring tubes and passageways respectively defining dispensing volumes for said different particles; said discharge ports being sized to contemporaneously discharge the respective particle contents of said measuring tubes and passageways;

f. pneumatically actuated compression valves respectively disposed immediately above and in flow communication with said measuring tubes for selectively admitting said

different particles into said tubes and said passageways; and

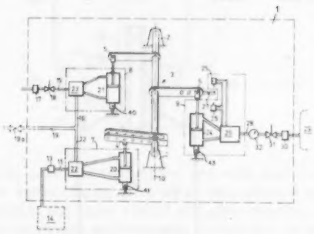
g. means for respectively permitting gravity transfer of said different particles from said supply hoppers to the upstream sides of said compression valves.

3,926,345

DEVICE FOR THE BATCHING OF MEDIA

Elgas Pulk, deceased, late of Stockholm, Sweden, by Carlgustaf Hallsenius, Administrator, Uppsala, Sweden, and John Paul Noren, Upplands Vasby, Sweden, assignors to Stabilator AB, Bromma, Sweden

Continuation of Ser. No. 327,313, Jan. 29, 1973, abandoned. This application Mar. 24, 1975, Ser. No. 561,426
Claims priority, application Sweden, Feb. 3, 1972, 1276/72
Int. Cl.² F04B 9/08
U.S. Cl. 222—145 3 Claims



1. A device for batching at least two liquid media in mutually predetermined proportions by volume comprising

a power source including a double acting cylinder with associated control valves adapted for operation by an air pressure source connected to an input line thereof,

an adjustable pressure regulator in the input line of the power source,

a pair of pump units each including a double acting cylinder and a flow controlling valve unit suitably connected to an input line and a delivery line of each pump unit,

a rocker element pivotally connected to the power source and the pump units,

means for varying the distance between the rocking axis of the rocker element and the pivot connection to at least one pump unit,

means for varying the distance between the rocking axis of the rocker element and the pivot connection to the power source,

a common porportioning line into which the delivery lines from the pair of pump units terminate,

a valve controlling the outlet of the common proportioning line,

said rocker element being such that torque generated by the power source around the rocking axis of the rocker element is balanced when the valve in the common proportioning line is in a closed position by counter torque generated around the rocking axis of the rocker element by the pump units thereby enabling the pump units to be stopped by closing the valve,

said inlet line of a first of the pair of pump units supplying a non-pressurized medium,

said input line of the second of the pair of pump units supplying pressurized medium, and

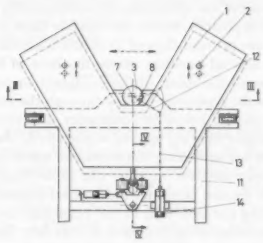
a pressure regulator in the input line of the second pump unit by means of which the head of the pressurized medium to be mixed is reduced to a lower level in the input line of the second pump unit to a pressure lower than the lowest feed pressure that occurs in the input line of the second pump unit on account of pressure variations thereof.

3,926,346

APPARATUS FOR ADJUSTING THE POSITION OF A V-SHAPED TUNDISH IN TWO-STRAND CONTINUOUS CASTING PLANTS

Karl Dub, Vienna, and Stefan Biricz, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft

Filed Feb. 18, 1975, Ser. No. 550,607
Claims priority, application Austria, Feb. 19, 1974, 1300/74
Int. Cl.² B22D 37/00, 41/12
U.S. Cl. 222—160 7 Claims



1. An apparatus for position-adjusting a V-shaped tundish in three directions perpendicular relative to each other, in particular when exchanging the tundish, in two-strand continuous casting plants, comprising:

a liftable and lowerable carrier connected to said tundish,

a column arranged close to the center of gravity of said tundish and liftably and lowerably supporting said carrier,

a movable car with a platform,

a pedestal, rotatably arranged in said platform and supporting said column in a position eccentrical of the axis of said pedestal,

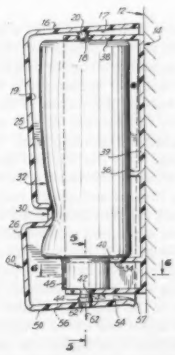
a fixable pivot-mechanism connected to the tundish for horizontal pivoting thereof around the axis of said column.

3,926,347

FLOWABLE MATERIAL DISPENSER WITH RESILIENT CONTAINER

Jack B. Low, Brooklyn, N.Y.; Buckley Crist, Plainfield, and Thomas J. Zoltner, Morris Plains, both of N.J., assignors to Jaclo, Inc., Brooklyn, N.Y.

Filed July 10, 1974, Ser. No. 487,257
Int. Cl.² B65D 37/00
U.S. Cl. 222—185 3 Claims



1. A hand operated dispenser for controlling the flow of flowable material from a flexible, shape retaining container

having a spout, comprising supporting means for retaining the container in an inverted position with the spout of the container maintained substantially stationary relative to said supporting means, a hand actuated outer cover having an outwardly exposed hand-receiving portion, a floor fixed to the cover and located at the bottom of the dispenser, said floor including a separated portion adapted to flex toward and away from spout of the container, means for providing a seal between the flexible floor portion and the spout of the container, a hole defined within the flexible floor portion and communicating with the outside of the dispenser at the bottom thereof, means for mounting the cover for movement of the floor beneath the spout of the container in a substantially horizontal plane from a first position where the flexible floor portion and the sealing means prevent flow of flowable material from said container to a second position where the hole of the floor is positioned beneath the spout of the container to permit flowable material in the container to flow through the hole into the hand of a user placed below the dispenser, said cover further including a bumper bearing against a portion of the side wall of the container for squeezing the container upon hand actuation of the cover and for moving the floor from said first position to said second position, the natural expansion of the container moving the side wall of the container to return the floor from said second position back to said first position, and means for adjusting the pressure applied by the bumper to said side wall by varying the position of the bumper relative to said cover.

3,926,348

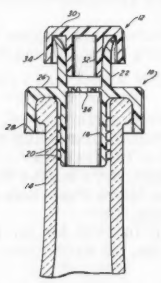
POURING FITMENT WITH FILTER

Robert S. Lutzker, 21 Lee Ave., East Williston, N.Y. 11596

Filed Jan. 14, 1975, Ser. No. 540,876

Int. Cl.[2] B65D *25/48*

U.S. Cl. 222—189 **4 Claims**



1. Resealer for wine bottles including a pouring fitment for extending across and sealing engagement with the neck of the bottle, the fitment including an upper end and a lower end, the lower end having means for securing and sealing the fitment to the neck of the bottles, the means at the lower end of the fitment for securing the fitment to the neck of the bottle including a downwardly extending tube having a series of radial lips that engage with the internal surfaces of the neck for cooperating in securing the fitment thereto, said means at the lower end of the fitment including a radial flange that rests on the top of the neck for providing an additional sealing zone therewith, an apron extending downwardly from the outer periphery of the flange and being adapted to engage with outer surfaces of the bottle neck for cooperating in providing an additional sealing zone and additional securement of the fitment to the neck of the bottle, a tubular extension projecting upwardly at the upper end of the fitment and including an outwardly flared dripless pouring lip, the pouring lip being an integral extension of the tubular extension and the pouring lip being defined by a tapered edge that reduces to a feathered edge, the cap extending across the upper end of the fitment for engaging with the tubular extension and pouring lip for sealing the bottle contents, the cap including a top circular plate, a downwardly depending tube and a concentric outer downwardly depending apron, the tube engaging with internal surfaces of the tubular extension for providing a sealing zone and securement of the cap to the fitment, the bottom of the top plate engaging with the pouring lip to provide an additional sealing zone of the cap with the fitment.

3,926,349

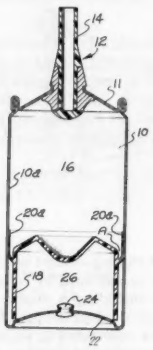
VALVE CONSTRUCTION FOR A PRESSURE OPERATED CONTAINER

Robert S. Schultz, 7 Heusted Drive, Old Greenwich, Conn. 06870

Continuation-in-part of Ser. No. 290,977, Sept. 21, 1972, Pat. No. 3,827,607, which is a continuation-in-part of Ser. No. 175,253, Aug. 26, 1971, abandoned. This application Mar. 28, 1974, Ser. No. 455,892

Int. Cl.[2] B65D *83/14*

U.S. Cl. 222—402.22 **16 Claims**



1. In combination, for use in a pressurized container, a rigid centrally apertured container closure member having a substantial conical taper in the direction of the aperture, an elastomeric bushing fitted to the concave taper and extending through the aperture, the lower end of said bushing being in axial proximity to the bushing fit to said taper, said bushing having a central longitudinal bore extending axially through the aperture region of the closure member, and a tiltable valve member having a substantially flat seating surface seated in axial abutment with said lower end of said bushing and including a cylindrical dispensing stem fitted to and extending through and beyond the outer end of the bore of the bushing; whereby in the presence of internal pressure within a container of which said closure member forms a part, said valve member and bushing are pressure-loaded against the convergent taper, thus enhancing seal engagement of said bushing to said taper and of said bushing to said stem.

3,926,350

PLASTIC COLLAR PERCOLATOR

Herbert N. Muehlhausen, and John J. Unger, both of Elmhurst, Ill., assignors to Sunbeam Corporation, Chicago, Ill.

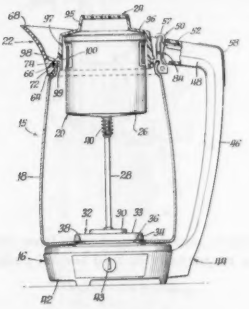
Filed July 9, 1974, Ser. No. 486,923

Int. Cl.[2] A47G *19/14*

U.S. Cl. 222—475 **6 Claims**

5. A vessel for serving coffee or the like comprising, a glass member having a bottom wall and a side wall terminating at its upper end with a concave annular groove and a beaded upper edge, a non-breakable plastic split collar member sealingly mounted on the upper end of said glass member, said collar member being characterized by a vertical slot which extends from its upper edge to its lower edge whereby to define a pair of spaced-apart split ends and by a pouring spout

formation which is disposed diametrically opposite said split ends of said collar member, a downwardly opening groove formed in the underside of said collar member and defined in part by a depending skirt portion having a convexly curved inner annular surface, an elongated solid sponge rubber sealing member seated in the upper end of said downwardly opening groove, said collar member being mounted on said upper end of said glass member with said beaded upper edge being received in said downwardly opening groove in sealing engagement with said sealing member and with said convexly curved inner surface being received in said concave annular groove formed at the upper end of said glass member, a pair of outwardly projecting embossments formed one on each of the adjacent split ends of said collar member at the lower edges thereof and having alignable horizontally disposed bores formed therein, and nut and bolt fastening means extending through said bored embossments for tightening said collar member on said glass member.



3,926,351

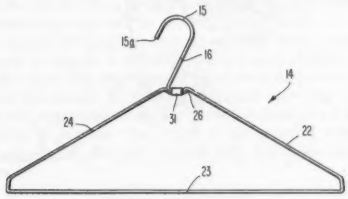
GARMENT HANGER

John S. Baer, Schooner Head, Bay Harbor, Maine 04609

Filed Oct. 24, 1974, Ser. No. 517,650

Int. Cl.² A47J *51/097*

U.S. Cl. 223—88 **9 Claims**



1. A garment hanger composed of a single continuous-length rigid wire of uniform cross-section formed into a generally triangular body portion with suspension means extending outwardly from the apex of the triangle, the triangle having side element converging toward the apex and having a stretcher run extending between the remote ends of said side elements, the improvement wherein said side elements are formed from the wire, each side element terminating at the apex in a U-shaped connecting piece having a pair of spaced-apart legs interconnected by an intermediate base portion, the connecting pieces of the two side elements nesting one within the other at the apex of the triangular body portion with the base portions thereof disposed flush against one another in a line along the length thereof, said connecting portions being all coplanar with said side elements and positioned in nesting relation without crossovers, said base portions when in nested relation serving to complete the triangular body intermediate the side elements, the connecting piece more remote from the stretcher run being on the exterior side of the body, and the other connecting piece being on the interior side of the body, the wire at the far end of said exterior connecting piece opposite its associated side element being formed into an open suspension hook projecting from the triangular body portion within the plane of said body portion, the wire at the far end of the interior connecting piece terminating closely adjacent the side element associated with the exterior connecting piece, and uniting means positioned intermediate said spaced-apart legs uniting said base portions in nested relation along the length thereof to prevent lateral or transverse separation of the connecting pieces.

3,926,352

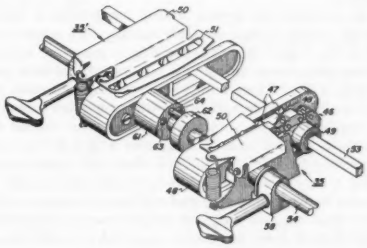
QUICK CHANGE LABELING HEAD

Dean S. Kercher, Woodstock, and Trygve R. Rod, Mundelein, both of Ill., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 372,877, June 25, 1973, Pat. No. 3,854,351, which is a division of Ser. No. 153,313, June 15, 1971, Pat. No. 3,774,489. This application Apr. 11, 1974, Ser. No. 459,997

Int. Cl.² B65H *17/38*

U.S. Cl. 226—79 **3 Claims**



1. As a means to facilitate changeover of an addressing machine labeling head from one size label form to another size label form, said labeling head including a form feeder pair cooperable with the label form margins to feed said forms to said labeling head, the combination of:

means supporting at least one of said form feeders for adjusting movement relative to the other of said form feeders whereby to enable the relative spacing between said form feeder pair to be adjusted for the label form being handled;

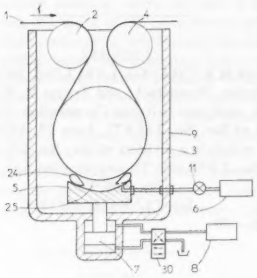
locating means disposed adjacent said one form feeder in a preset locating position; and

indexable gauge means adjacent said locating means and engageable therewith to position said one form feeder relative to said locating means and thereby locate said one form feeder relative to the other form feeder, said gauge means having spacing surfaces of predetermined dimension at each index position thereof corresponding to different ones of said label forms for engagement with said locating means whereby to enable said one form feeder to be expediously set for the specific label form being handled.

3,926,353
APPARATUS ADAPTED FOR DRIVING OR BRAKING A METALLIC BAND

Pierre Gay, La Tour En Jarez, France, assignor to Creusot-Loire Enterprises, Paris, France

Filed Jan. 7, 1975, Ser. No. 539,224
Claims priority, application France, Jan. 11, 1974, 74.00917
Int. Cl.[2] B65H 17/28
U.S. Cl. 226—95 8 Claims



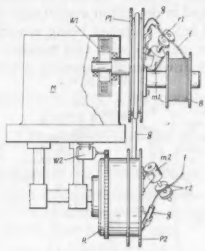
1. In a system for driving a strip comprising a roller for receiving a strip, a shoe movable radially with respect to the roller in the region in which the strip is received, means for injecting compressed air radially inwards of said shoe against said strip, a fixed frame movably supporting said shoe, a jack acting on said shoe in said frame whereby when compressed air is applied between said shoe and said strip on said roller, said strip is applied against said roller with a force equal to that exerted by said jack on said shoe, the compressed air forming a very thin fluid cushion and providing a very small clearance between said shoe and said strip preventing rubbing of said shoe on said strip, an improvement comprising an annular hollow joint of flexible material on said shoe surrounding a chamber formed in said shoe and into which said compressed air is introduced to apply the strip against said roller, said joint having an orifice which opens into said chamber so that when the chamber is pressurized by the compressed air the joint will simultaneously be pressurized and inflated.

3,926,354
CONTINUOUS FEED DEVICE FOR FILIFORM BODIES PARTICULARLY FOR ROTATING WELDING MACHINES FOR PIPES

Sergio De Santis, No. 55, Via A. Traversari; Giovanni Farello, No. 4, Via dei Tizii, both of Rome, and Roberto Torrani, No. 40, Via Strada Lanzo, Borgaro Torinese Turin, all of Italy

Filed May 22, 1974, Ser. No. 472,509
Claims priority, application Italy, May 29, 1973, 50273/73
Int. Cl.[2] B65H 17/18
U.S. Cl. 226—108 7 Claims

1. A device for continuously feeding filiform bodies from a source of supply to a rotary user device comprising in combination first and second pulleys rotatably mounted on first and second shafts, respectively, a supply spool mounted on a shaft on said first pulley for rotation relative to said first pulley, a flexible and inextensible sliding sheath having its one end fastened to said first pulley and its other end to said second pulley and being wound on both said pulleys, said second pulley being fastened to the rotary user device, means for causing the filiform body to slide inside the sheath at a predetermined speed, and means for rotating said second pulley to

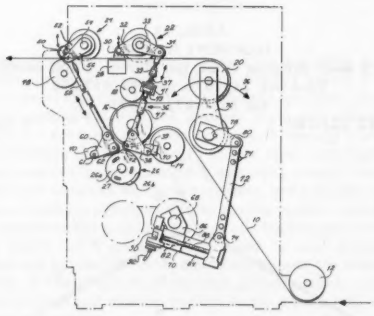


cause said sheath to unwind tangentially from said first pulley and to wind up tangentially on said second pulley.

3,926,355
APPARATUS FOR INTERMITTENTLY FEEDING LENGTHS OF CONTINUOUS SHEET MATERIAL AT A CONSTANT VELOCITY

George N. Bonnell, Summerville, N.J., assignor to Bobst Champlain, Inc., Roseland, N.J.

Filed Oct. 21, 1974, Ser. No. 516,371
Int. Cl.[2] B65H 17/42
U.S. Cl. 226—114 12 Claims



1. Apparatus for handling a continuous sheet material comprising a metering roll, a feed roll intermittently engaging and disengaging the material, reciprocating brake means for stopping the movement of the material during each disengagement of the material by said feed roll, a looper roll located along the material between said metering roll and said feed roll and means for cyclically moving said looper roll, said moving means comprising a shaft, means for oscillating said shaft and mechanical linkage operatively connecting said shaft to said looper roll, said linkage comprising a first and a second member, said members being operatively connected together by a pivotal joint, said first member comprising a first part mounted to said shaft and a second part connected to said pivotal joint and means for adjusting the position of said second part relative to said first part such that the distance between said shaft and said joint may be varied.

3,926,356

INSERTS

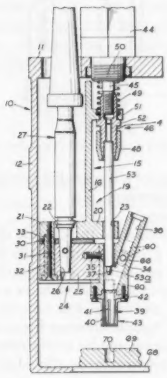
Leslie Ernest Still, Wolverhampton, England, assignor to The Precision Screw & Manufacturing Company Limited, Willenhall, England

Filed June 24, 1974, Ser. No. 482,375

Claims priority, application United Kingdom, July 19, 1973, 34443/73

Int. Cl.[2] B27F 7/02

U.S. Cl. 227—114 6 Claims



1. Apparatus for installing metallic inserts into a thermoplastic workpiece, comprising a fixed workpiece support bed, a fixed supporting frame, a mandrel reciprocably mounted on the frame, having a tip shaped to fit and carry an insert to be driven thereby, an insert-receiving member reciprocably mounted on the frame, having a passage which is open at both ends and is axially aligned with the mandrel, means for supplying inserts one at a time to said passage, means for heating the insert-receiving member to transmit heat therefrom to the inserts, means for reciprocating the mandrel axially relative to the frame to engage a metallic insert in said passage and to carry and drive the insert into a workpiece supported on the bed, and mechanism for moving the insert-receiving member toward the workpiece before each insert is thus driven into the workpiece, to increase the length of time during which the insert remains in thermal contact with the insert-receiving member.

3,926,357

PROCESS FOR APPLYING CONTACTS

Robert Michael Matrisian, New Cumberland, Pa., assignor to c/o E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Oct. 9, 1973, Ser. No. 404,791

Int. Cl.[2] B23K 1/06, 21/02

U.S. Cl. 228—110 5 Claims

1. A process for attaching an element to a member comprising,

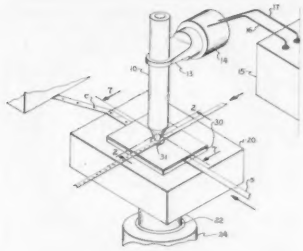
supplying a member on one side of a plate to a welding zone,

supplying an element on the opposite side of the plate to the welding zone,

superposing the element with the member in the welding zone through an opening in the plate,

welding a selected portion of the element to the member through the opening in the plate, and

stripping the unwelded portion of the element from the welded portion by advancing the element and the member on opposite sides of the plate from the opening in the plate in the welding zone.



3,926,358

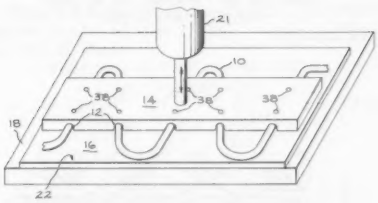
APPARATUS AND METHOD FOR DEFORMING TUBING FOR ULTRASONIC WELDING OF THE TUBING TO A PLANAR STRUCTURE

William F. Hester, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 7, 1975, Ser. No. 539,245

Int. Cl.[2] B23K 19/04

U.S. Cl. 228—111 8 Claims



6. A method for deforming tubing and maintaining tubing in forcible contact with the structure for ultrasonically welding the tubing to the structure, comprising:

inserting the tubing in a groove of a pressure block;

urging the tubing in the block against the structure;

deforming a first side of the tubing into a planar surface in contact with the structure while deforming other portions of the tubing into a preselected curvilinear configuration by urging the tubing in the block against the structure with a preselected force; and

maintaining the deformed tubing in forcible contact with the structure for ultrasonically welding the planar surface of the deformed tubing to the structure.

3,926,359

METHOD OF CONVERTING BRAKE BAND END CONNECTION

Thomas J. Victory, 25167 Harcourt, Farmington, Mich. 48024

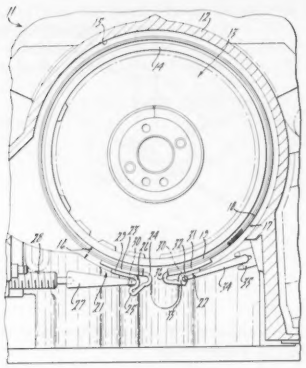
Continuation of Ser. No. 256,447, May 24, 1972, Pat. No. 3,785,042. This application Oct. 29, 1973, Ser. No. 410,708

Int. Cl.[2] B23K 1/20

U.S. Cl. 228—170 2 Claims

1. A method of converting a brake band end connection of the type having a strut seat formed by a double-folded end plate, the juncture uniting said two folds being radially outermost, to an end connection of narrower radial dimensions for

installation between a drum and housing, comprising the steps of cutting off said juncture to thereby reduce the radial dimension of said end connection, and relieving one corner of said end connection to facilitate entry into said housing.

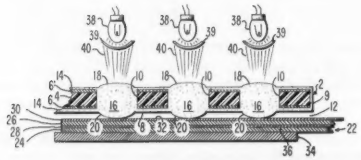


3,926,360

METHOD OF ATTACHING A FLEXIBLE PRINTED CIRCUIT BOARD TO A RIGID PRINTED CIRCUIT BOARD

Douglas E. Moister, Jr., Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 28, 1974, Ser. No. 473,698
Int. Cl.[2] H01R *43/00*
U.S. Cl. 228—180 **7 Claims**



1. A method for solderably joining a selected terminal of a flexible printed circuit board to a selected terminal of a rigid printed circuit board comprising the steps of:

a. providing one or more apertures in the rigid printed circuit board through its said selected terminal,

b. plating the surfaces of said selected terminals,

c. pre-heatably filling each of said apertures with a globule of solder of sufficient size to produce a protruding convex upper and lower meniscus thereof as a byproduct of said plating,

d. bringing the selected terminal of said flexible printed circuit board into compressible contact with each of said lower convex meniscuses of solder in the apertures of said rigid printed circuit board,

e. arranging an infrared heating source and focusing means therefor in aligned focusing relationship relative to each of said upper meniscuses of solder, and

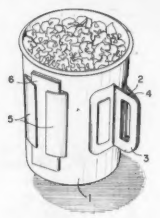
f. controllably activating each of said infrared heating sources such that an infrared beam of controlled intensity and time-duration is directed upon each of said upper convex meniscuses to bring each of said solder globules to a molten state and to thereby capillarily transform each of said lower convex meniscuses to a radially formed solder joint between said selected terminals when said molten solder solidifies.

3,926,361

DISPOSABLE CONTAINER WITH NAPKIN HOLDER

Henry R. Hilderbrand, Los Angeles, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Aug. 9, 1974, Ser. No. 496,039
Int. Cl.[2] B65D *3/28*
U.S. Cl. 229—1.5 B **2 Claims**



1. The combination of a disposable container and a napkin, said combination comprising

a disposable container;

a handle member affixed to the outside of the container and movable from a position substantially juxtaposed with the container to a position extending substantially radially from the container and utilizable as a handle; and

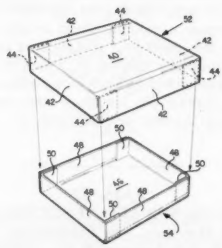
a napkin holder affixed to the outside of the container spaced from the handle member for releasably supporting a napkin, said napkin holder comprising a pair of substantially identical halves, each affixed to the container in spaced relation with the other and opening toward the other, said halves clamping the napkin, between them, to the container.

3,926,362

TELESCOPIC CONTAINER MEMBERS

Herman D. Beck, Los Angeles, and Thomas H. Cook, La Puente, both of Calif., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed June 10, 1974, Ser. No. 477,628
Int. Cl.[2] B65D *13/04*
U.S. Cl. 229—23 BT **4 Claims**



1. A blank of foldable Material adapted to be separated into two portions which may be folded to form separate, complementary body and cover members of a telescopic container, said blank having a pair of outer longitudinal fold lines formed on a first side thereof and a pair of inwardly offset longitudinal fold lines formed on a second side thereof, said longitudinal fold lines terminating at the longitudinal extremities of said blank, a transverse separation means formed therein and terminating at the transverse extremities of said blank for separating the blank into bodyforming and cover-forming portions, opposed transverse slots extending inwardly at least to said inwardly offset longitudinal fold lines and interrupting

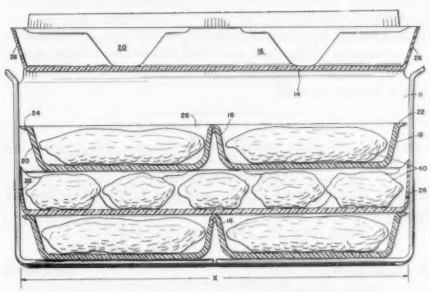
the continuity of said outer longitudinal fold lines in the body-forming portion of said blank, transverse fold lines disposed intermediate the inner margins of said opposed transverse slots in said body-forming portion and formed on said second side of said blank, opposed transverse slots extending inwardly at least to said outer longitudinal fold lines in the cover-forming portion of said blank and transverse fold lines disposed intermediate the inner margins of said opposed transverse slots in said cover-forming portion and formed on said first side of said blank, whereby when said body-forming portion is separated from said cover-forming portion along said transverse separations means and is folded about said inwardly offset longitudinal fold lines and said transverse fold lines, respectively, on said second side of said blank a body member is formed, and when said cover-forming portion is folded about said outer longitudinal fold lines and said transverse fold lines, respectively, on said first side of said blank, a complementary cover member is formed.

3,926,363

STACKING TRAYS AND CONTAINER FOR PERSIHABLE ITEMS

Marvin C. Catron, 2983 E. 69th St., Tulsa, Okla. 73111

Filed Sept. 20, 1974, Ser. No. 507,688
Int. Cl.² B65D *1/00*
U.S. Cl. 229—2.5 **5 Claims**



1. Apparatus for transporting perishable goods comprising in combination

a plurality of plastic trays;

a container having a square opening of side dimension X to receive said trays;

each of said trays comprising: an essentially rectangular bottom portion having a first pair and a second pair of upwardly and outwardly sides extending from said bottom and open at the top thereof to receive said perishable goods;

said first pair of sides being opposed, each extending upwardly from the bottom and terminating at a desired height with a horizontal outwardly extending lip, the outside dimension of said lips being equal to or slightly less than said dimension X;

said second pair of sides being opposed and extending outwardly such that the free outside dimension of the upper termination of said sides is greater than said dimension X, said second pair of sides being flexible and pivotal inwardly from said bottom to a position such that said outside dimension is substantially equal to said dimension X; and;

said trays stacked one on top of another in said container opening alternately having said first pair of sides of one tray transverse to the said second pair of sides of the next tray.

3,926,364

BRACING PACKAGE

Veikko Janhohen, Viikinmaentie 19, 00560 Helsinki 56, Finland

Filed Nov. 16, 1973, Ser. No. 416,371
Claims priority, application Finland, Nov. 20, 1972, 3255/72
Int. Cl.² B65D *33/00*
U.S. Cl. 229—55 **7 Claims**

1. A bracing package comprising

a folded over bracing plate having a pair of sides and a stressed bend for urging said sides apart,

a bag-like part for receiving flat goods disposed between said sides of said plate in secured relation to said sides said bag-like part being wholly within said plate and having an open mouth within said plate for opening when said sides of said bracing plate are urged apart, and

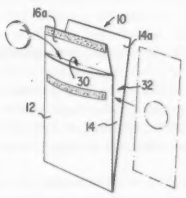
fastening means mounted on said sides for securing said sides together about said tubular part.

3,926,365

RECEPTACLE FOR COINS, CURRENCY AND THE LIKE

Harvey D. Sandstrom, Duluth, Minn., assignor to Sklaris II, Inc., Duluth, Minn.

Filed June 10, 1974, Ser. No. 478,144
Int. Cl.² B65D *27/08*
U.S. Cl. 229—72 **12 Claims**



1. A receptacle for currency, coins and the like, said receptacle comprising a single blank comprising a substantially rectangular central panel and first and second substantially rectangular side panels located on opposite sides of said central panel, said receptacle including a first, generally rectangular pocket formed between said central panel and said second side panel, said second side panel being located behind said central panel, a second pocket which is open at the top and on one side and is formed between said second side panel and said first side panel, said first side panel being located behind said second side panel, said central panel including a flap which extends outwardly from said central panel and which lies rearwardly of and is secured to said first side panel at a lower portion thereof, said second side panel including an upper portion which extends beyond the upper edge of said central panel and which is capable of serving as a closing flap for said first pocket, the shape of the upper edge portion of the single blank being the reciprocal of that of the lower edge portion thereof so that a plurality of said blanks can be laid out

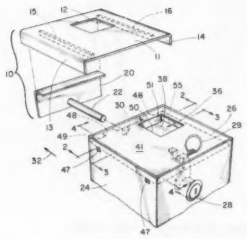
seriatim along a rectangular sheet of stock material without any material being left over.

3,926,366

PILFER-PROOF LOCKING COVER FOR A COIN BOX

August M. Sciortino, 1838 Weeg Way, Park Ridge, Ill. 60068

Filed Mar. 1, 1974, Ser. No. 447,156
Int. Cl.² G07B *15/00*
U.S. Cl. 232—15 **9 Claims**



1. A coin box cover which is detachably lockable to the open top of a coin box having a bar receiving hole in one side thereof and which is cooperable with a coin box receiving bracket having a coin passageway and a bar that extends from the bracket generally parallel to said cover, the bar being receivable through the bar receiving hole, said cover having a coin receiving window which registers with the passageway when said coin box is brought into mating engagement with the bracket, and said cover comprising:

A. shutter means movable across said window and resiliently biased to a window closed position,

B. tab means on said shutter means engagable by the bar received through the hole for moving said shutter means to a window open position as said window is brought into registry with the passageway,

C. resiliently biased hole covering means movable across an inner-facing surface of said one side to cover the hole when said cover is mounted to the coin box and after said tab means have been moved a short distance by the bar and the bar is then withdrawn, said hole covering means initially being held in a hole open position by said tab means, and

D. latch means operative to lock said shutter means in said window closed position after said shutter means have been moved a short distance towards said window open position and then returned to said window closed position,

whereby when said coin box is brought into mating engagement with the coin box receiving bracket, said window is initially closed and the hole is open and when said coin box is removed from the bracket, said window is closed, said shutter means are locked in said window closed position and the hole is covered by said hole covering means to prevent insertion of a probe through the hole.

3,926,367

COMPLEX FILTERS, CONVOLVERS, AND MULTIPLIERS

James W. Bond, and Jeffrey M. Speiser, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 27, 1974, Ser. No. 509,755
Int. Cl.² G06F *15/34;* **G06G** *7/19*
U.S. Cl. 235—181 **6 Claims**

2. A complex filter, which utilizes only real filters, to which the two components of a complex input signal A + jB may be applied, the complex filter giving the same output which would result from a complex multiplication of the applied input signal A + jB with a complex signal C + jD, comprising:

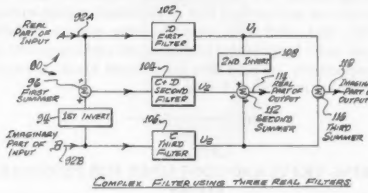
a first means for inverting an input signal, for example signal B;

a first signal summer, at one of whose inputs is applied the signal A, the other input being connected to the signal −B, the output of the inverting means;

a first filter, whose impulse response is D, to which the signal A is also applied;

a second filter, whose impulse response is C + D, whose input is the output of the first signal summer;

a third filter, whose impulse response is C, and whose input is the applied signal B;



COMPLEX FILTER USING THREE REAL FILTERS

a second means for inverting an input signal, whose input is connected to the output of the first filter;

a second signal summer, whose three inputs are connected to the output of the second inverting means and the outputs of the second and third filters, and whose output comprises the real part of the complex product of the complex numbers A +jB and C + jD; and

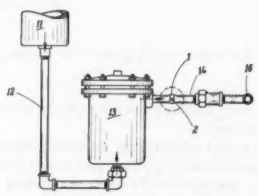
a third signal summer, whose two inputs are connected to the outputs of the first and third filters and whose output comprises the imaginary part of the complex product of A + jB and C + jD.

3,926,368

STEAM TRAP TEMPERATURE INDICATING ARRANGEMENT

Wesley C. Geen, Addison, Ill., assignor to Reliance Brooks, Inc., Cleveland, Ohio

Filed Aug. 19, 1974, Ser. No. 498,711
Int. Cl.² G05D *23/12;* **G08B** *23/00*
U.S. Cl. 236—41 **23 Claims**

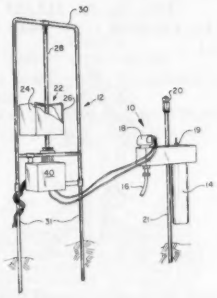


1. An arrangement including: a) heater means adapted to receive steam at a selected pressure; b) heater outlet means connected with said heater means to provide for emission of condensate from said heater means; c) a steam trap means having inlet means connected with said heater outlet means and trap outlet means to provide for emission of condensate from said trap means; and d) a temperature actuated indicator element fastened in heat transfer relation with a condensate return pipe means from said trap outlet means including a temperature sensitive material preselected to change color at a selected temperature between 10 and 35 degrees centigrade lower than the saturated steam temperature of said steam in said heater means where the pressure of said saturated steam varies from 0 PSIG to 300 PSIG and wherein said temperature actuated indicator is fastened on the condensate pipe means so as to give an indication of when the steam trap means is leaking.

3,926,369
CONTROLLED SPRAYING

George W. Pearce, 32 Monument St., Wenham, Mass. 01984

Filed Nov. 30, 1973, Ser. No. 420,453
Int. Cl.[2] B05B 17/00
U.S. Cl. 239—1 27 Claims



1. A method of controlled spraying comprising.

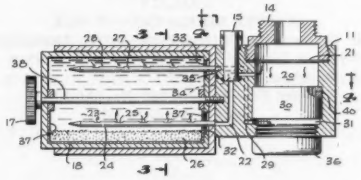
sensing each occurrence of the wind exceeding a predetermined velocity from a predetermined plurality of directions at a predetermined location,

intermittently providing a spray into said wind for a predetermined time interval from said predetermined location upon sensing only predetermined ones of said occurrences.

3,926,370
FLUORIDATION APPARATUS

Cornelius Keith Vandervelden, Kansas City, Mo., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.

Filed Sept. 16, 1974, Ser. No. 506,260
Int. Cl.[2] E03B 9/20; B05B 7/28, 7/12
U.S. Cl. 239—25 15 Claims



1. An apparatus for connection to a liquid source, said apparatus comprising:

a main chamber having an inlet in its upper portion adapted for coupling to the liquid source, and an outlet in its lower portion;

a reservoir chamber located adjacent said main chamber, said reservoir chamber having a quantity of chemical releasing substance disposed therein;

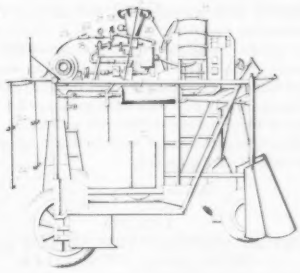
first and second by-pass conduits interconnecting the interiors of the main and reservoir chambers; and

means located within said main chamber for proportioning the ratio of the liquid flowing through said reservoir chamber with respect to liquid flowing only through the main chamber under all pressure, temperature and flow conditions, said proportioning means separating said main chamber into an inlet compartment and an outlet compartment, said first by-pass conduit interconnecting the interiors of the inlet compartment and the reservoir chamber, said first by-pass conduit being sufficiently small to enable the liquid flow therethrough to be laminar, and said second by-pass conduit interconnecting the interiors of the outlet compartment and the reservoir chamber.

3,926,371
APPARATUS AND SYSTEM FOR MIXING PESTICIDE WITH WATER CONCURRENTLY WITH SPRAYING

Edsel A. Harrell; Woodrow W. Hare, and John R. Young, all of Tifton, Ga., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sept. 17, 1974, Ser. No. 506,932
Claims priority, application Germany, Sept. 18, 1973, 2346818
Int. Cl.[2] A01G 25/09; B05B 9/02, 1/20; A62C 13/60
U.S. Cl. 239—146 8 Claims



1. A system for mixing pesticides with water concurrently with spraying and comprising in combination:

a. a means of storing water for mixing with pesticide

b. a means for storing pesticide connected to

c. a mixing chamber for mixing pesticide with water into a homogeneous sprayable solution of proper concentration comprising:

1. a positive water level control apparatus capable of controlling the water level in the mixing chamber to a preset condition and communicating with the said water storage means through a flexible connection

d. a means of dispensing the pesticide in accurately measured continuous quantity and a means of transferring said pesticide to said mixing means

e. a means of transferring the mixed pesticide solution from said mixing means to

f. a pressure regulator comprising:

1. a pressure control apparatus

2. an inlet

3. a dual outlet comprising:

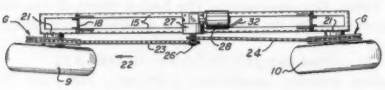
a. a recycle means communicating between the pressure regulator and the mixing means

b. an outlet means communicating between the pressure regulator and a set of spray nozzles, said outlet having an on-off positive control means located to function between the pressure regulator and the spray nozzles to allow for flow control of the pesticide solution and the material of the said outlet means possessing a flexible characteristic.

3,926,372
GUARD FOR SELF-PROPELLED SPRINKLING APPARATUS

H. Gordon Johnson, 3502 Rangeview Road, Greeley, Colo. 80631

Filed Oct. 2, 1974, Ser. No. 511,165
Int. Cl.[2] B05B 3/12
U.S. Cl. 239—177 10 Claims



1. In an elongated sprinkler having a series of substantially aligned, connected pipe sections and spaced supports therefor, means for sprinkling an area of land during movement of said sprinkler thereover, motorized drive means and means for controlling said drive means in response to a support moving ahead or behind an adjacent support, the improvement comprising:

a drive wheel at each of the front and rear of a support, said motorized drive means being mounted on said support intermediate said drive wheels;

a chain sprocket mounted on each drive wheel;

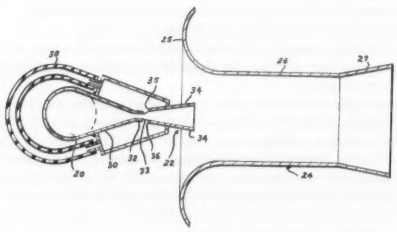
a separate chain extending from said drive means to each wheel and engaging the sprocket thereof; and

guard means associated with each sprocket for limiting the entry of foreign objects between said chain and the respective sprocket formed as a circular member affixed to each side of said sprocket.

3,926,373
THRUST AUGMENTATION SYSTEM WITH OSCILLATING JET NOZZLES

Hermann Viets, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 26, 1974, Ser. No. 492,078
Int. Cl.[2] B64C 15/10
U.S. Cl. 239—265.17 3 Claims

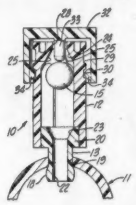


1. A thrust augmentation system comprising; a thrust chamber having an inlet region, a mixing region and a diffuser region; at least one nozzle for directing an oscillating gas jet into said inlet region in a substantially longitudinal direction through said thrust chamber to thereby entrain a secondary flow of air through said thrust chamber; said nozzle including a converging section, a straight section, a sudden expansion section and wall members extending forward of said sudden expansion section; means for directing a flow of gas through said nozzle; a pair of opposed control ports in said nozzle adjacent the inlet to said sudden expansion section; means for forming a feedback loop interconnecting said control ports.

3,926,374
METHOD FOR IRRIGATING TERRAIN

Wilbur C. Reeder, 1961 Midwick Drive, Altadena, Calif. 91001, and Norman D. Batterson, 3870 Shadow Grove Road, Pasadena, Calif. 91007

Division of Ser. No. 323,638, Jan. 15, 1973, Pat. No. 3,873,031, which is a continuation-in-part of Ser. No. 131,355, April 5, 1971, Pat. No. 3,746,263. This application Nov. 1, 1974, Ser. No. 519,803
Int. Cl.[2] B05B 17/00; B44D 1/08
U.S. Cl. 239—1 6 Claims

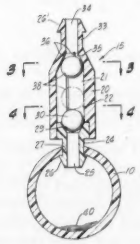


1. That method of purging a weeper flow control device of sediment and the like while connected to a pressurized irrigating system utilizing a temporary augmented water flow from that device for purging, said weeper device being of the type having a tubular housing equipped interiorly thereof with a captive flow-responsive member normally held by water pressure in a flow restricting position adjacent an outlet for said device and automatically movable away from flow restricting upon cessation of water flow through said weeper device, said method comprising manually blocking flow from the outlet of said weeper device while the irrigating system remains pressurized and allowing the resulting equalization of water pressure around said captive member to permit said captive member to move away from said flow restricting position, and thereafter abruptly restoring the flow of water from the outlet of said device whereby the resulting sudden flow of pressurized water past said captive member is effective to purge sediment and the like from said seat.

3,926,375
WEEPER IRRIGATION DEVICE

Wilbur C. Reeder, 1961 Midwick Drive, Altadena, Calif. 91001, and Norman D. Batterson, 3870 Shadow Grove Road, Pasadena, Calif. 92507

Filed Feb. 3, 1975, Ser. No. 546,218
Int. Cl.[2] B05B 15/00
U.S. Cl. 239—542 7 Claims



1. A weeper irrigating device comprising a tubular housing having an inlet passage at the lower end thereof connectable to a source of pressurized water at one end and an outlet passage at the upper end thereof, a valve seat embracing the inner end of the each of said passages, said seat on the inner end of said outlet passage having a minute flow passage therethereacross, first and second flow responsive freely movable valve members held captive between said valve seats, said first valve

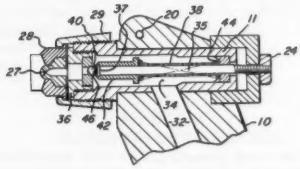
member being seatable on the valbe seat at the inner end of said outlet passage to restrict the escape of water from said weeper device so long as said inlet passage is connected to a source of pressurized water, and said second valve member being held slightly ajar from said valve seat at the inner end of said inlet passage by water flow therepast so long as there is a flow of pressurized water past said first valve member via said minute flow passage.

3,926,376

SPRAY GUN VALVE

Bernard Siczek, La Grange Park, Ill., assignor to Graco Inc., Minneapolis, Minn.

Filed May 19, 1975, Ser. No. 578,542
Int. Cl.[2] B05B *1/30;* **F16K** *31/00*
U.S. Cl. 239—583 **10 Claims**



1. A safety spray gun apparatus for accepting hydraulically pressurized fluid and for emitting an atomized fluid spray through an orifice under control of an actuating trigger, comprising:

a. an internal valve interposed in the path between said pressurized fluid and said orifice;

b. a valve opening and closing member attached to said valve and projecting externally in actuating contact with said actuating trigger;

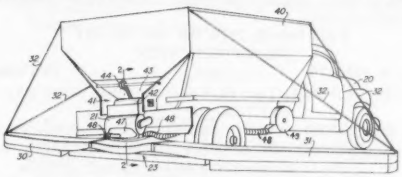
c. a resilient and deformable member enclosing said valve opening and closing member in sealing relationship, and urging against said valve to bias said valve in closure position to block fluid flow to said orifice.

3,926,377

APPARATUS FOR SPREADING GRANULATED AND PULVERIZED MATERIAL

Arvid B. Johnson, 8016 S. Telford Way, Sandy, Utah 84070

Filed Jan. 2, 1975, Ser. No. 537,929
Int. Cl.[2] A01C *15/04*
U.S. Cl. 239—655 **13 Claims**



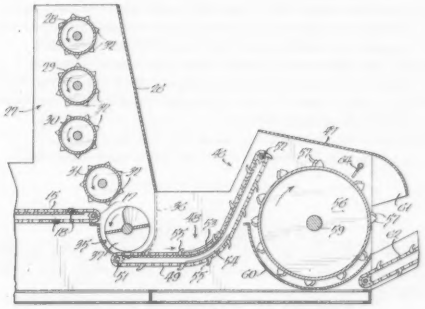
1. Spreading apparatus adapted to be attached to a vehicle to receive granular or pulverized material from a supply of said material on the vehicle and to spread said material substantially uniformly over the ground, said spreading apparatus comprising air-lock feeder means and a distributor unit closely coupled in communication with each other through flow passage means extending therebetween, said air-lock feeder means being adapted to receive said material from the supply thereof on the vehicle and to continuously feed said material to the distributor unit through the flow passage means, said distributor unit comprising a distributor disc which is rotatably mounted within a distributor body for rotation about a substantially vertical axis, said distributor disc having an axial opening therein in direct flow communication with said flow passage means, said distributor disc also having a delivery passage therein which is in flow communication with said axial opening, said distributor body having a plurality of passageways therein adapted for sequentially registering with said delivery passage as said distributor disc rotates; a plurality of distribution tubes whose discharge ends are disposed in one or more groups extending from said distributor body with the respective discharge openings of the tubes in each group being substantially equally spaced therealong, the other ends of said tubes being in flow communication with respective passageways in said distributor body; means for rotating said distributor disc; and means for supplying a stream of air to said distributor unit, whereby said stream of air entrains said material and carries it through said delivery passage in said distributor disc and projects it sequentially into the respective passageways of said distributor body as said distributor disc rotates, said air stream and entrained material then flowing through the respective distribution tubes to discharge through said discharge openings.

3,926,378

HAY STACK DISINTEGRATING APPARATUS

Kelly P. Ryan, Blair, Nebr., assignor to Blair Manufacturing Company, Blair, Nebr.

Filed Jan. 30, 1975, Ser. No. 545,619
Int. Cl.[2] B02C *13/20*
U.S. Cl. 241—154 **5 Claims**



1. Apparatus of the character described comprising,

a bed of a size sufficient to receive and support a hay stack; a conveyor on the bed; a vertical array of horizontally arranged toothed rolls rotatably mounted at one end of the bed, said array being of hay stack height and extending transversely substantially the width of the bed; a hay chopper at said end of the bed; means for rotating the rolls; means for operating the conveyor to feed a hay stack on the bed into the rolls to disintegrate the stack; and means for feeding hay disintegrated by the rolls into the hay chopper.

3,926,379

SYRINGE DISINTEGRATOR

Gale E. Dryden, and Derrick Harris, both of Indianapolis, Ind., assignors to Dryden Corporation, Indianapolis, Ind.

Filed Oct. 4, 1973, Ser. No. 403,343
Int. Cl.[2] B02C *9/04, 19/12;* **F24H** *1/00*
U.S. Cl. 241—69 **8 Claims**

1. Disintegrator apparatus comprising:

a mill for milling objects fed thereto into particles and having a plurality of openings in the bottom thereof;

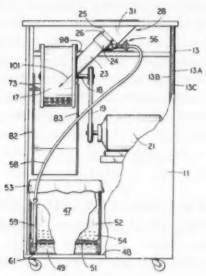
a motor driving the mill;

a feeding tube associated with the mill for conveying syringes and the like to the mill;

particle collecting means associated with said mill and positioned to receive from the mill, the particles derived from milling the items fed to the mill through said tube, and

fluid storage means communicating with said collecting means for contact of said particles therein with a fluid to disinfect said particles,

said collecting means including a drawer having a portion open at the top and disposed below said mill directly under said openings in the bottom thereof and collecting



particles which have fallen through said openings in the bottom of said mill and are received through the open top portion of said drawer from said mill; and wherein:

said storage means include a liquid container connected to said drawer and containing liquid communicating with particles in the interior of the drawer through apertures in a wall of said container,

said mill has a horizontal input shaft; and

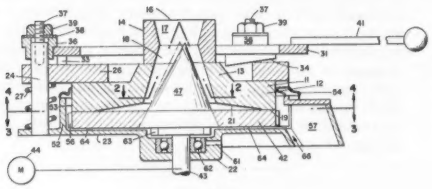
said motor is behind the mill and drives said input shaft.

3,926,380

GRAIN MILLING DEVICE

Ronald R. Musgrove, and Lloyd E. Connelly, both of San Leandro, Calif., assignors to Emcee Corporation, San Leandro, Calif.

Filed May 24, 1974, Ser. No. 473,203
Int. Cl.² B02C *7/08, 7/14*
U.S. Cl. 241—248 **12 Claims**



1. A machine for grinding grain and the like, comprising:

a non-rotating grinding implement,

a rotating grinding implement opposed to said non-rotating grinding implement and spaced apart therefrom, and rotating about a fixed axis, including a nutating member, extending from said rotating implement toward said non-rotating implement;

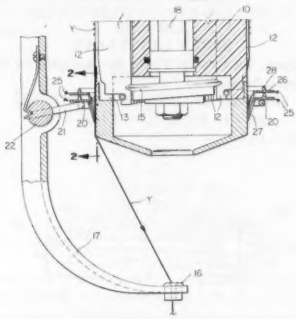
feed means for introducing the grain between said rotating and non-rotating grinding implement, and said nutating member comprising a conical member joined coaxially to said fixed axis of said rotating grinding implement.

3,926,381

YARN TENSIONING MEANS

John B. Lawson, Providence, R.I., and Charles S. Cooper, Attleboro, Mass., assignors to Lawson-Hemphill, Inc., Central Falls, R.I.

Continuation-in-part of Ser. No. 431,478, Jan. 7, 1974. This application Apr. 18, 1974, Ser. No. 461,909
Int. Cl.² B65H *51/20, 59/00*
U.S. Cl. 242—47.01 **4 Claims**



1. A yarn tension ring for a yarn storing device having a yarn storage drum, said tension ring including:

a. a base ring for surrounding the storage drum,

b. a plurality of bristle-like flexible elements extending from the base ring axially beyond the base ring and inwardly toward the axis of the ring, whereby the tips of the flexible elements are contiguous with the surface of the drum when the tension ring is mounted relative thereto, and

c. means for locating a second yarn tensioning ring surrounding the storage drum at a selected, axially spaced, distance from said tension ring to space the tips of the flexible elements of of a second yarn tension ring from the tips of the flexible elements of said tension ring a distance sufficient to avoid contact between the respective flexible elements of said tension ring and a second ring,

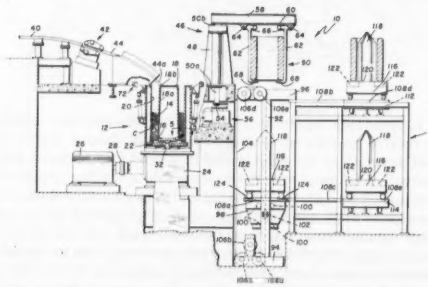
d. said locating means comprising spacer means mounted on the base ring and extending from the base ring in a direction generally opposed to the direction toward which the flexible elements extend from the base ring.

3,926,382

COIL FORMING AND TRANSFER APPARATUS

Donald Sieurin, Northboro, and Roger Kinnicutt, Jr., Holden, both of Mass., assignors to Morgan Construction Company, Worcester, Mass.

Filed Nov. 8, 1974, Ser. No. 522,087
Int. Cl.² B21C *47/24*
U.S. Cl. 242—79 **10 Claims**



1. Apparatus for forming a longitudinally moving elongated product length into an upstanding cylindrical coil, and for

transferring the thus formed coil to another location, comprising:

a pouring reel having a coil support plate, an inner core means fixed to and extending vertically from said support plate, and an outer wall means surrounding said support plate and said core means and cooperating therewith to define a chamber, the combination of said support plate, core means and outer wall means being rotatable whereby the introduction of the longitudinally moving elongated product length into said chamber will result in the product length being formed into an upstanding cylindrical coil;

means for elevating said support plate and said core means relative to said outer wall means to vertically remove the coil to an elevated position above said pouring reel; transfer means overlying said pouring reel, said transfer means being adapted to engage the coil at said elevated position, whereby when said support plate and said core means are lowered towards said pouring reel, the coil will remain supported at said elevated position on said transfer means; and means for moving said transfer means to another lateral location.

3,926,383

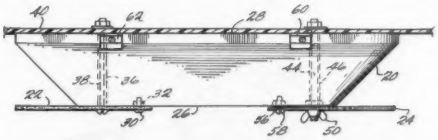
WATER SKI ROPE HOLDER

Vince McConnell, 5615 O St., Lincoln, Nebr. 68510

Filed Nov. 29, 1974, Ser. No. 528,580

Int. Cl.[2] B65H *75/36*

U.S. Cl. 242—85.1 **6 Claims**



1. A water ski tow rope holder comprising:

a base member having a cross-sectional area which decreases from a first side adapted for attachment to a boat to a second side,

first and second rope retainer member each attached adjacent one end thereof to said second side and each extending outwardly from the point of attachment, at least one of said retainer members being pivotably attached to said second side,

manually releasable means cooperating with said one retainer member for releasably holding that retainer member in a fixed position, and

clip means mounted on said base member for releasably holding a water ski tow bar.

3,926,384

LOCKING MECHANISM FOR AUTOMOBILE SAFETY BELT RETRACTOR

Per Olof Weman, Alber Kirchweg 85, 2081 Haslah, Germany

Filed July 26, 1973, Ser. No. 382,971

Int. Cl.[2] A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 **8 Claims**

1. A locking mechanism operated by inertia and adpated for use with one or more safety belts of the type wherein the safety belt is wound around a spool, said spool having one or more ratchet wheels connected thereto, said locking mechanism comprising:

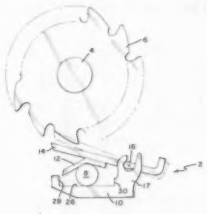
an inertia member adapted to be disposed in a rest position when said locking mechanism is inoperative and adapted to be displaced from said rest position by inertia;

a retaining base for said inertia member, said inertia member being supported on said retaining base;

a substantially conical actuation member having an open bottom, sides and a top, said actuation member disposed above said inertia member and centered over said rest position of said inertia member, said actuation member movable by said inertia member; and

a locking dog affixed to said actuation member, whereby displacement of said inertia member from said rest position causes said locking dog to engage said ratchet wheel to restrain said safety belt against movement in the withdrawal direction; wherein:

at least a portion of said inertia member extends into said open bottom of said actuation member, a portion of said sides of said actuation member extending at least partially over and around at least a portion of said inertia member; said locking dog engages said ratchet wheel at one end of



said locking dog and said locking dog has a pivot point at the opposite end of said locking dog from the end which engages said ratchet wheel, said actuation member affixed between said ends of said locking dog; and

said actuation member is slightly tilted, thereby providing uniform sensitivity to the engaging action of the locking dog to the ratchet wheel; and the angle formed by the side of said actuation member adjacent the end of said locking dog having said pivot point with a vertical plane through the top of said actuation member being greater than the angle formed by the side of said actuation member adjacent the end of said locking dog which engages said ratchet wheel with the vertical plane.

3,926,385

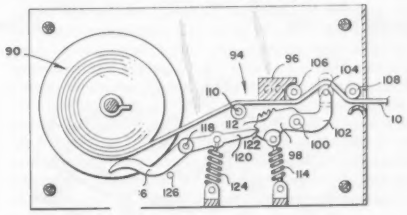
RETRACTABLE SAFETY BELTS

Richard G. Board, 3000 Connecticut Ave., Washington, D.C. 20008, and Nelson H. Shapiro, 640 Washington Bldg., Washington, D.C. 20005

Division of Ser. No. 409,266, Nov. 5, 1964, Pat. No. 3,817,473, and a continuation-in-part of Ser. No. 377,344, June 23, 1964, Pat. No. 3,289,970. This application Mar. 18, 1974, Ser. No. 452,351

Int. Cl. B65h *75/48*

U.S. Cl. 242—107.4 **14 Claims**



1. A retractable seat belt comprising a retraction reel, a strap connected to said reel for retraction and extension, clamp means for preventing extension of said strap, said clamp means comprising a pair of clamp elements, one of said elements being movable relative to the other, said one element comprising a slider, said strap being trained from said reel between said clamp elements and around said slider reversely whereby tension in said strap exerts a force upon said slider tending to move said one clamp element toward the other,

means responsive to the amount of strap wound upon said reel for moving said one clamp element away from the other, and means for maintaining said one clamp element away from the other until said strap is extended to a desired length.

3,926,386

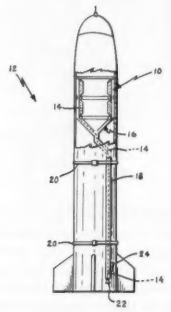
SPOOL FOR WIRE DEPLOYMENT

James R. Stahmann, Miramar, Fla., and Charles B. Kalakowsky, Dorchester, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 9, 1974, Ser. No. 486,804

Int. Cl.[2] B65H *75/02, 49/00*

U.S. Cl. 242—118 **9 Claims**



1. A spool utilized for the deployment of wire comprising a body about which said wire is wound, said body being formed of a first and second section, means operably connected to said body for applying a braking force to said wire during unwinding thereof from said first section, said braking means being formed of a first braking ring located about said body separating said first and second sections and a second braking ring adjustably mounted on said body adjacent said first braking ring whereby said wire passes through a space formed between said first and second braking rings and means operably connected to said second section for guiding the unwinding of said wire therefrom.

3,926,387

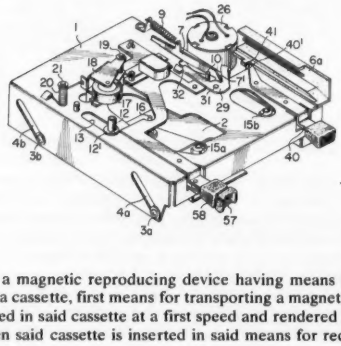
MAGNETIC REPRODUCING DEVICE

Nobuhiro Hirabayashi, Iwakura, Japan, assignor to Shin-Shirasuma Electric Corporation, Nagoya, Japan

Filed Apr. 11, 1974, Ser. No. 460,178

Int. Cl.[2] G03B *1/04;* **G11B** *15/32, 23/04*

U.S. Cl. 242—198 **3 Claims**



1. In a magnetic reproducing device having means for receiving a cassette, first means for transporting a magnetic tape contained in said cassette at a first speed and rendered operable when said cassette is inserted in said means for receiving same, second means for transporting said magnetic tape at a second speed substantially higher than said first speed, and means for reproducing sound pre-recorded on said magnetic tape, a slide chassis having means engageable by said cassette when inserted in said means for receiving same and movable from a first position to a second position, an actuator on said slide chassis for engaging said first transporting means and rendering same operable when said slide chassis is moved to said second position, a fast-forward mechanism comprising a manually operable lock means movable to operate said second transporting means, a lock pin on said slide chassis, said lock means being movable into locking engagement with said lock pin when said slide chassis is in said second position, and indicating means on said lock means for confirming by sense of touch the position of said manually operable lock means.

3,926,388

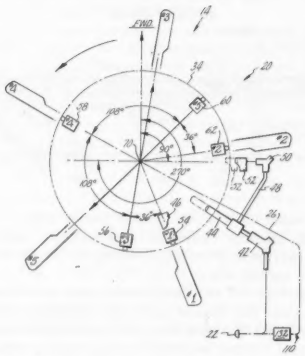
SEQUENTIAL HELICOPTER BLADE EJECTION SYSTEM

John W. Johnson, Cromwell, and Robert A. Selleck, Trumbull, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 207,813, Dec. 14, 1971, abandoned. This application June 13, 1973, Ser. No. 369,691

Int. Cl.[2] B64C *27/00*

U.S. Cl. 244—17.11 **34 Claims**



1. In combination:

A. a helicopter,

B. a helicopter rotor adapted to be mounted for rotation about an axis of rotation,

C. a plurality of helicopter blades connected to said rotor for rotation therewith, and

D. means for sequentially separating said blades from said rotor such that the separated blades will travel in a predetermined direction with respect to the helicopter.

3,926,389

AIRCRAFT OF A CONTROLLABLE STABILITY

Andreas Mederer, Markt Schwaben, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Continuation of Ser. No. 362,854, May 22, 1973, abandoned. This application Aug. 9, 1974, Ser. No. 496,119

Claims priority, application Germany, May 24, 1972, 2225169

Int. Cl.[2] B64C *5/04;* **B64B** *1/36*

U.S. Cl. 244—45 A **4 Claims**

1. An apparatus for use on an aircraft to maintain a stabilized flight of an aircraft about a center of gravity thereon, comprising:

propulsion means for propelling a gaseous jet rearwardly from the aft end of said aircraft;

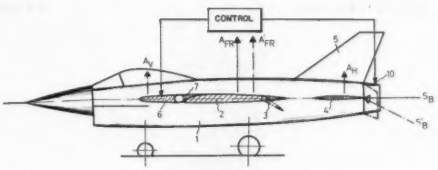
movable nozzle means mounted in the flow path of said gaseous jet to control the direction of discharge of said

gaseous jet along a variable flow axis relative to the longitudinal axis of said aircraft, said movable nozzle means being movable between a first position wherein the controlled discharge flows along said flow axis to thereby develop solely a thrust force for propulsion of said aircraft and a second position wherein the controlled discharge flows along a flow axis inclined downwardly to said longitudinal axis of said aircraft to thereby develop both a thrust force for propulsion of said aircraft and a first lifting moment about said center of gravity of said aircraft at the tail end thereof;

a fixed wing for aerodynamic support of said aircraft and having extendible flap means movably mounted thereon; a vertical tail surface;

a horizontal tail surface, said horizontal tail surface developing, during flight, a second moment about said center of gravity of said aircraft at the tail end of said aircraft;

a movable fore-wing shorter in length than said fixed wing mounted forwardly of said fixed wing and adapted to move about means defining a vertical pivot axis secured to means defining the fuselage for said aircraft between first and second positions, said fore-wing having first leading edge surface means and said fixed wing having second leading edge surface means, said first leading edge surface means, when said fore-wing is in said first position, forming a continuation of said second leading edge surface means on said fixed wing so that said first and



second leading edge surface means together define a single leading edge surface, said fore-wing in said first position and said fixed wing together developing, during flight, a third lifting moment about said center of gravity, said third lifting moment being located just slightly in front of said center of gravity, said second lifting moment and said third lifting moment being generally equal to each other when said movable nozzle means is in said first position to thereby achieve a first stabilized flight characteristic, said fore-wing, in said second position, being spaced forwardly of said fixed wing and defining a separate auxiliary wing and separate first and second leading edge surface means, and said fixed wing, with said flap means in the extended position, each generating separate fourth and fifth moments, respectively, about said center of gravity, the sum of said fourth and fifth moments defining a sixth lifting moment located forwardly of said center of gravity and being greater in magnitude than said second lifting moment, the sum of said second lifting moment and said first lifting moment developed by said movable nozzle means in said second position being generally equal to said sixth moment to thereby achieve a second stabilized flight characteristic; and

control means for relating the movement of said movable nozzle means and the movement of said fore-wing to develop said first and second stabilized flight characteristics.

3,926,390

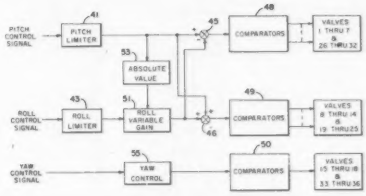
CONTROL VALVE LOGIC

Roland E. Teuber, Huntington Beach; John L. Pearson, Culver City, and Charles D. Brown, Pacific Palisades, all of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 308,614, Nov. 21, 1972, abandoned. This application June 25, 1974, Ser. No. 482,939

Int. Cl.² F42B *15/18*

U.S. Cl. 249—3.22 **3 Claims**



1. A control system for use in controlling fluid flow regulating means comprising:

a. first and second signal means;

b. variable gain means having an input, control, and output, with said first signal means being connected to said control of said variable gain means to control the gain thereof inversely in accordance with the value of said first signal means, and said second signal means being connected to said input of said variable gain means;

c. a first mixer having first and second inputs and an output, said first mixer combining its inputs in an additive fashion, with said output of said variable gain means connected to said first input of said first mixer and said first signal means being connected to said second input of said first mixer;

d. a second mixer having first and second inputs and an output, said second mixer combining its inputs in a subtractive fashion, with said output of said variable gain means being connected to said first input of said second mixer and said first signal means being connected to said second input of said second mixer;

e. first and second sets of comparators with said first set of comparators being connected to said output of said first mixer, and said second set of comparators being connected to said output of said second mixer;

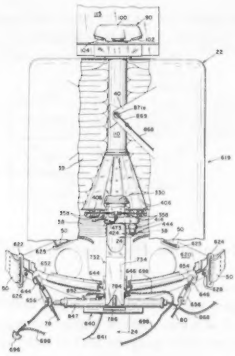
f. said first and second sets of comparators having a plurality of at least four units making up each of said sets of comparators, each said comparator unit having an input and an output, said input of each of said comparator units connected to said output of said associated mixer, with each said comparator unit being set such that it will not have an output until the voltage on its input exceeds a predetermined set value, and with half of said individual comparator units of each of said set of comparators being set such that they will have predetermined set values in stepped sequence as the output of the associated mixer increases positively in voltage and the other half of said individual comparator units of said set of comparators having predetermined set values in stepped sequence as the output of the associated mixer increases negatively in voltage; and

g. fluid flow regulating means each having an input connected to said output of said individual comparator units whereby each said fluid flow regulating means is activated only when said first and second signal means results in said input of said comparator unit to which said fluid flow regulating means is connected, receiving the proper amount and polarity of voltage thereby allowing multiple selective activation of said fluid flow regulating means by the variation of only said first and second signal means.

3,926,391
FAIL-SAFE BALLISTIC PARACHUTE SPREADER APPARATUS

Louis R. Nordine, Aurora, Colo., assignor to Stanley Aviation Corporation, Denver, Colo.

Filed July 7, 1965, Ser. No. 470,111
Int. Cl. B64d 17/72
U.S. Cl. 244—149 19 Claims



1. In a parachute assembly, a parachute having a canopy, a canopy spreading apparatus comprising a plurality of projectiles, means securing said projectiles to said canopy, a spreader head, retainer means releasably retaining said projectiles in unprojected positions on said spreader head, gas generator means for supplying gas under pressure to the interior of said to effect the powered projection of said projectiles away from said head, said projectiles being effective upon being projected away from said head by said gas to spread said canopy, and means responsive to a pre-selected parachute suspension line stretch to release said retainer means in the event said projectiles are not projected away from said head, said projectiles being freed for displacement away from said head when said retainer means is released, and said canopy being freed from said head for aerodynamic opening upon freeing said projectiles from said head.

3,926,392
IRON MINDER

William E. Davidson, Ontario, Calif., assignor to General Electric Company, Bridgeport, Conn.

Filed June 28, 1974, Ser. No. 484,296
Int. Cl.² D06F 75/40
U.S. Cl. 248—117.1 4 Claims

1. An iron minder attachment for an ironing board to controllably position and support an iron such as a steam iron having a handle opening and comprising,

an adjustable foot means for securement to a board,

a flexible arm fastened at one end to said foot for universal adjustment,

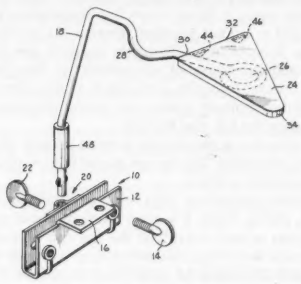
said arm directed upwardly and including a side extension directed outwardly to extend generally parallel over a board,

an inclined triangular plane means at the other end of said arm,

said arm extending from one end position of a base of the triangle with the opposite apex directed to the handle opening of a board-supported iron,

a bend in the arm adjacent the plane,

the lower end of the triangular plane disposed to enter the handle opening of said iron

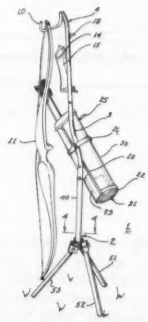


whereby the iron, when pushed onto said plane, is simultaneously cammed up and forced by the arm side extension to drop into said bend nose up for storage with no more than the heel touching the board.

3,926,393
COLLAPSIBLE BOW AND ARROW STAND

Thomas R. Tainsh, 7224 E. Jenan Drive, Scottsdale, Ariz. 85260

Filed May 30, 1974, Ser. No. 474,816
Int. Cl.² F16M 11/32; A45F 3/44
U.S. Cl. 248—165 6 Claims



1. A collapsible stand formed of three detachable components for supporting an archer's equipment, said stand comprising in combination:

a. a detachable upper member, said upper member including a laterally extending hook for supporting at least one bow;

b. a detachable central member, said central member including support means for supporting a quiver, said support means comprising:

1. a rod attached to said central member in non-alignment therewith;

2. a receiver secured to the lower end of said rod for receiving the bottom of the quiver; and

3. a U-shaped bracket extending from the upper end of said rod for supporting the upper end of said quiver;

c. stud means disposed intermediate said upper member and said central member for selectively attaching and detaching said upper member and said central member;

d. a detachable tripod for supporting said central member and said upper member, said tripod including:

1. a stanchion;

2. three legs; and
3. bracket means for pivotally attaching said legs to one end of said stanchion, said bracket means accommodating pivotal movement of said legs from a juxtaposed position with said stanchion to a locked position;

e. further stud means disposed intermediate said central member and said tripod for selectively attaching and detaching said central member and said tripod, and

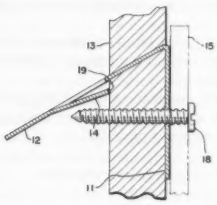
f. strap means for securing said upper member, said central member and said tripod to one another to form a bundle; whereby, said stand is erected by attaching respective ones of said upper member, said central member and said tripod and privotally positioning said legs to a depending position from said stanchion and said stand is collapsed for storage and transportation by detaching said upper member, said central member and said tripod from one another, pivotally positioning said legs to a juxtaposed position with said stanchion and bundling said upper member, said central member and said tripod together with said strap means.

3,926,394

WALLBOARD FASTENER

Albert Mauceri, 69 Bretton Road, Hauppauge, N.Y. 11787, and Carl Mirarchi, 7 Dorchester Road, Smithtown, N.Y. 11788

Filed Oct. 3, 1974, Ser. No. 511,551
Int. Cl.² E04G *3/00*
U.S. Cl. 248—217 **9 Claims**



1. A wall fastener for attachment to a wallboard surface of a predetermined thickness comprising:

a substantially flat mounting surface for mounting on the front surface of the wallboard;

a prong coupled to the mounting surface and having a point directed at an acute angle with respect to the plane of the mounting surface; and

spring retaining means formed within the prong having an edge for engagement with the back surface of the wallboard.

3,926,395

BRACKETS

Georges Felix Lallement, 115, rue Pelleport, 75020 Paris, France

Filed June 21, 1973, Ser. No. 372,287
Claims priority, application France, June 27, 1972, 72.24185; July 31, 1972, 72.28144
Int. Cl.² A47F *5/00*
U.S. Cl. 248—223 **4 Claims**

1. A dynamically stable article-supporting bracket assembly for perforated panels, comprising:

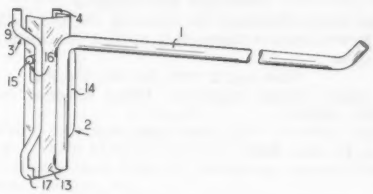
a pivot pin;

prong means, fixedly attached to said pivot pin;

bracket means, securely attached to said pivot pin and said prong means;

support arm means pivotally firmly attached to said bracket means;

said pivot pin rotoatably positioned within said bracket means such that said prong means may be partially inserted into a perforated panel perpendicular to the panel when said bracket means are in a final position of said bracket means, with subsequent pivoting of said prong means with said pivot pin while said bracket means remain unmoved, to a non-forced locking position of said prong means parallel to the panel; and



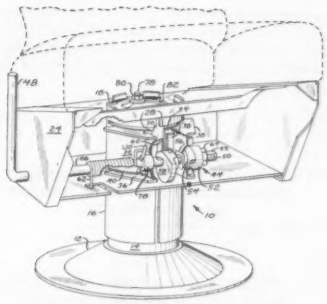
said pivot pin and said bracket means being mutually slidable with respect to each other, and said prong means and said bracket means being mutually relatively sized, such that after said prong means have been inserted in the panel and then pivoted to the non-forced locking position of said prong means, said bracket means may be slid over a portion of the prong means to firmly secure the prong means against the perforated panel.

3,926,396

LOCKING MECHANISM FOR PEDESTAL SEAT

Garth O. Hall, New Berlin, and Paul H. Unangst, Brookfield, both of Wis., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed June 12, 1974, Ser. No. 478,555
Int. Cl.² A47C *3/00*
U.S. Cl. 248—418 **8 Claims**



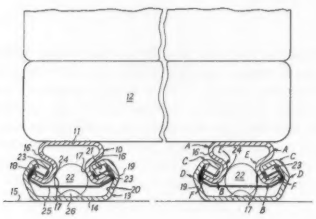
1. In a rotatable seat for a motor vehicle having an outer longitudinally slotted tubular member attached to the seat frame and a telescoped inner tubular member attached to a base, the improvement comprising bracket means affixed to a longitudinal portion of said outer tubular member on opposite sides of the longitudinal slot; shaft means carried by said bracket means; cam means and detent means carried by said shaft means; handle means on said shaft means for rotating said shaft means, said cam means and said detent means; an aperture means formed in said inner tube, said aperture means being positioned relative to said longitudinal slot so that when the seat is in its driving position the aperture means is aligned with the longitudinal slot and with said detent means whereby rotation of said handle means will cause said detent means, which is mounted for rotation with said shaft means, to move into or out of said aperture means and will cause said cam

means to cooperate with said bracket means on said opposite sides of said slot to cause said bracket means to be moved toward each other so as to compress said longitudinal portion of said outer tubular member to reduce its diameter and force its inner surface into binding frictional contact with the outer surface of said inner tubular member.

3,926,397
VEHICLE SEAT SLIDES

Alec Alfred Hunwicks, Northampton, England, assignor to Brown Brothers Engineering Limited, Northampton, England

Filed Aug. 2, 1974, Ser. No. 494,372
Claims priority, application United Kingdom, Aug. 13, 1973, 38323/73
Int. Cl.² B60M *1/08*
U.S. Cl. 248—430 **8 Claims**

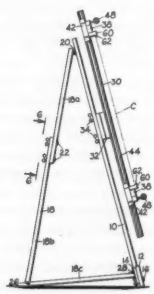


1. A slide mechanism comprising a first channel having a base adapted to be secured to a movable member, a second channel in sliding engagement with said first channel and having a base adapted to be secured to a stationary member, and central roller means between said channels and having convex end faces, one of said channels having limbs which extend inwardly to bear on said convex faces and then outwardly to terminate in ends and provide a pair of recesses which are angled to open away from said other channel, and the other of said channels having limbs which provide abutment faces adjacent said ends of the recessforming limbs and then extend inwardly to enter said recesses and interlock to resist separation of said channels.

3,926,398
EASEL

Melvin C. Vincent, 2545 Washington St., Eugene, Oreg. 97405

Filed June 12, 1974, Ser. No. 478,457
Int. Cl.² A47B *97/04*
U.S. Cl. 248—448 **1 Claim**



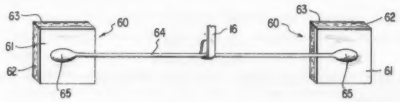
1. An easel for supporting a picture blank facewise to a person positioned in front of it comprising,

a. an upright standard,
b. a rear leg assembly on said standard for supporting the latter in upright position,
c. said leg assembly including a rearwardly extending segment hingedly connected at one of its ends to said standard and hingedly connected at its other end to one end of an upright segment,
d. the other end of said upright segment being connected with one end of a second upright segment in a releasable slidable joint,
e. said second upright segment having its other end hingedly connected to said standard above the hinge connection of said rearwardly extending segment with the standard, whereby said leg segments can be folded up against the back of said standard by releasing said slidable joint between said two upright segments and pivoting the rearwardly extending segment and said second upright segment toward the standard,
f. a cross arm on said standard,
g. connecting means rotatably connecting said cross arm on said standard with the axis of rotation extending from front to rear of said easel whereby said cross arm and picture blank thereon can be rotatably positioned in front of the person,
h. said rotatable connecting means comprising a friction connection whereby said holder will remain in its rotatably adjusted position except when intentionally rotated,
i. said rotatable connecting means between said cross arm and said standard being vertically adjustable on said standard to position said cross arm at the desired height,
j. a pair of brackets on said cross arm between which a picture blank can be clamped for firmly holding it on said arm,
k. at least one of said brackets being adjustable along the length of said cross arm to adjust to different dimensioned picture blanks,
l. and releasable connecting means between said movable bracket and said cross arm for anchoring said latter bracket in a selected position.

3,926,399
WALL HANGER

Robert Kanof Tendler, Buckridge Drive, Amherst, N.H. 03031

Continuation-in-part of Ser. No. 400,622, Sept. 25, 1973, which is a continuation-in-part of Ser. No. 235,174, March 16, 1972, Pat. No. 3,788,588. This application Feb. 27, 1974, Ser. No. 446,394
Int. Cl.² A47F *7/14*
U.S. Cl. 248—467 **9 Claims**

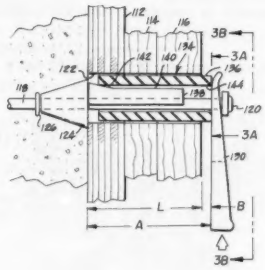


1. A hanger for mounting structures on a wall comprising in combination: an elongated flexible member having flat end pieces fixedly attached at the ends of said elongated flexible member and adhesive means (at either end thereof) for securing (the ends of said member) said end pieces to said structure in spaced apart relationship; and hook means for engaging said elongated member at an intermediate portion thereof, thereby to facilitate balancing of said structure on said wall by movement of said hook means along said intermediate portion to change the fulcrum.

3,926,400
TIE ROD AND SEAL ASSEMBLY

Eugene K. Franc, San Anselmo, Calif., assignor to Construction Engineering Products, San Rafael, Calif.

Filed Dec. 3, 1973, Ser. No. 421,398
Int. Cl.² E04G 17/08
U.S. Cl. 249—40 5 Claims

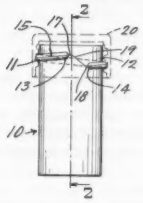


1. A tie rod and seal assembly in combination with a pair of spaced-apart wall forms for use in temporarily positioning said pair of spaced-apart wall forms, said tie rod and seal assembly comprising a generally elongated tie rod defining an axis and opposite ends, each of said rod ends being adapted to project through a respective bore in said spaced-apart wall forms, spreader means on said tie rod exterior to said form bores and adapted to contact the interior surfaces of the wall forms adjacent to said form bores for positioning said wall forms, and generally cylindrical seal means on each of said rod ends for positioning within and sealing against each said bore in said wall forms for preventing ingress and egress of fluid, said seal means including a generally cylindrical collar of resilient material mounted on the tie rod end and further including expansion means for radially expanding said collar in each said bore, and wherein said expansion means comprises a seal element mounted on the tie rod end adapted to be positioned within each said bore in said wall forms and having a smaller diameter portion and a larger diameter portion joined by an intermediate tapered frustoconical surface portion.

3,926,401
THREAD MOLD

John D. Northup, 2460 Underhill Road, Toledo, Ohio 43615

Filed Feb. 28, 1975, Ser. No. 554,232
Int. Cl.² B29C 1/14
U.S. Cl. 249—59 1 Claim



1. A mold for forming an article having a male thread, comprising:

a lower mold section comprised of a cavity having a neck portion of a cylindrical shape, the upper end of said lower section having a peripheral edge defining a helically shaped portion subtending an angle of less than 360° and including a pair of end points obliquely spaced from one another, said peripheral edge further including a portion extending between said end points, said helically shaped portion having a larger diameter than the surrounding areas to form a half male thread; and

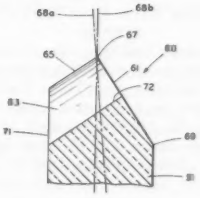
an upper mold section adapted to close in registry with the lower mold section, comprising a cavity having a neck portion shaped according to the neck portion of the lower mold section, the lower end of said upper mold section having a peripheral edge similar to and complementary with the peripheral edge of the lower mold section;

said first and second mold sections, when together in registry, forming a helical male thread mold subtending an angle of less than 3600° and having a parting line following the maximum diameter of the helical male thread.

3,926,402
PIN HAVING NONALIGNED CUBE AXIS AND PIN AXIS AND BUNDLE OF SUCH PINS

Sidney A. Heenan, Park Ridge, Ill., assignor to Amerace Corporation, New York, N.Y.

Division of Ser. No. 354,153, April 24, 1973. This application Feb. 18, 1975, Ser. No. 550,475
Int. Cl.² B29C 1/00; B29D 11/00
U.S. Cl. 249—117 30 Claims



1. A pin for use in making cube-corner reflectors capable of reflecting light back to the source thereof over a wide angle, said pin comprising an elongated shank being of regular polygon outline and having a longitudinally extending pin axis, and a cube-corner formation at one end of said shank and having a cube axis at an angle to said pin axis of other than zero degrees, said cube-corner formation having three mutually perpendicular faces symmetrically arranged with respect to said cube axis and respectively intersecting in three mutually perpendicular edges.

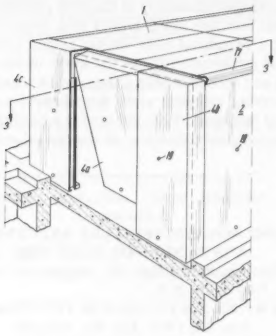
3,926,403
COLLAPSIBLE CARE MEANS FOR FORMING A THREE SIDED ENCLOSURE WITH A ROOF

Wolfgang Markewitz, Hilden, and Dieter Bolduan, Lintorf, both of Germany, assignors to Messrs. Huennebeck GmbH, Lintorf, Germany

Filed Oct. 15, 1973, Ser. No. 406,618
Claims priority, application Germany, Oct. 13, 1972, 2250214
Int. Cl.² E04G 9/08
U.S. Cl. 249—185 3 Claims

1. A room shuttering assembly for pouring rooms in concrete and steel reinforced concrete buildings, consisting of a ceiling shuttering, end-wall shuttering, and two opposed side-wall shuttering sections, connected as a unit, which side-wall shuttering sections are movable, during stripping, towards each other and the interior of the room, characterised in that the end-wall shuttering has a section which is pivoted about an axis towards said room interior such that the end-wall section, after pivoting permits movement towards each other and the

center of the room of the side-wall shuttering sections and the remaining sections of said end-wall shuttering which are



linked to the side-wall shuttering sections permitting the assembly to be withdrawn from the poured room.

3,926,404

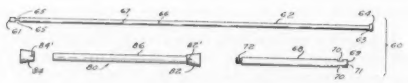
TIE ROD FOR USE WITH AN INTERNAL SPREADER MEANS

Peter R. Lovisa, Pelham, and Dusan Tausanovitch, Northport, both of N.Y., assignors to Peter R. Lovisa, Pelham; Dausan Tausanovitch, Northport and Tullio Lovisa, Huntington Station, all of, N.Y., part interest to each

Division of Ser. No. 232,450, March 7, 1972, Pat. No. 3,822,860. This application May 13, 1974, Ser. No. 469,421

Int. Cl.[2] E04G *17/08*

U.S. Cl. 249—213 **2 Claims**



1. A continuous reusable tie rod adapted to receive an internal spreader means for maintaining concrete forms a predetermined distance apart comprising a continuous rod having opposed ends and coupling means disposed adjacent each end for cooperating in releasably mounting the tie rod in fixed position on the concrete forms, engaging means intermediate the rod ends defining surfaces for cooperating in engaging surfaces of the spreader means so that the tie rod and spreader are disengagable from each other while the forms are still in place whereby the tie rod is retractable and removable from the concrete without damage to the tie rod or concrete, the tie rod including a cammming head, a tubular member having opposed ends slidably mounted on the rod and disposed between the engaging means defining the surfaces adapted to engage the surfaces formed on the spreader means and the camming head, one end of the tubular member being adjacent the camming head and having thereon one of the coupling means, the other end of the tubular member being formed with means for coupling to the spreader means.

3,926,405

SOLENOID OPERATED PROPORTIONAL VALVE

Kurt Arnold, West Caldwell, N.J., assignor to Valcor Engineering Corporation, Kenilworth, N.J.

Filed Aug. 21, 1974, Ser. No. 499,202

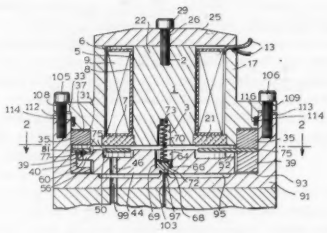
Int. Cl.[2] F16K *31/06*

U.S. Cl. 251—129 **11 Claims**

1. In a solenoid activated proportional valve having an inlet, outlet and valve means movable between an open and closed position for controlling flow of a medium from the inlet through the outlet, the improvement comprising:

electromagnetic force means acting on said valve means to move said valve means between said open and closed positions;

spring force means also acting on said valve means and biased against the electromagnetic force means acting on said valve means; and



means varying the spring constant of said spring means in response to the movement of said valve means, whereby the spring force opposing the electromagnetic force varies dependent on the position of said valve means, such forces being balanced when said valve means is in its open position.

3,926,406

CASTING OF METALS

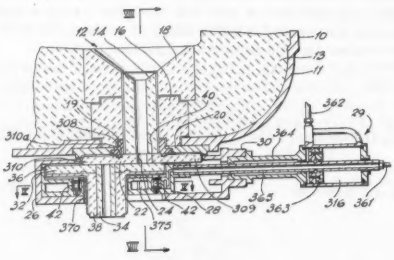
Robert Duncan Hind, Rotherham, England, assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 10, 1973, Ser. No. 387,570

Claims priority, application United Kingdom, Aug. 25, 1972, 39618/72

Int. Cl.[2] F16K *51/00*

U.S. Cl. 251—144 **11 Claims**



1. In a sliding gate valve assembly for controlling flow of molten metal, which assembly comprises a sliding gate member, a seating for said gate member, and resilient devices urging said gate member into sealing engagement with said seating, the improvement in which each of said devices comprises:

a core member;

two spaced-apart pad members mounted on said core member for relative movement in directions longitudinal of said core member;

a sleeve member slidably mounted on said core member intermediate said pad members and extending longitudinally of said core member;

spring means around said core member acting to urge said pad members apart; and

means including said sleeve member acting to restrict severely relative movement of said pad members toward each other to restrict correspondingly movement of said

gate member away from said seating in the event of failure of said spring means.

3,926,407

COCK WITH SHUTOFF MEMBER MOUNTED ECCENTRICALLY AND ROTATABLY IN A HOUSING

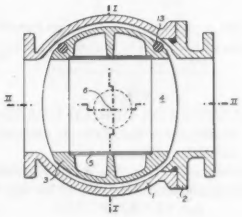
Siegmar Förster, and Walrath Von Klipstein, both of Heidenheim (Brenz), Germany, assignors to Firma Johannes Erhard, H. Waldenmaier Erben Suddeutsche Armaturenfabrik, Heidenheim, Germany

Filed Sept. 12, 1973, Ser. No. 396,531

Claims priority, application Germany, Apr. 26, 1973, 2321072

Int. Cl. F16k *5/12*

U.S. Cl. 251—315 **1 Claim**



1. A cock comprising a valve body substantially symmetric about an axis and having an inlet and outlet aligned axially perpendicular to said axis; shutoff member of substantially axially symmetric external configuration rotatable about an axis parallel to and offset from the axis of said body within the latter, said member having a main flow passage extending perpendicular to said axis and alignable with said inlet and said outlet in an open position of said member; sealing means on said member engageable with said body upon rotation of said member into a closed position of said member blocking flow from said inlet to outlet, said member defining with said body in positions of said member intermediate said open position and said closed position free cross sections collectively having a flow area of greater than 10% of the flow area of said main flow passage and extending uniformly and without sharp flow cross section variation in all intermediate positions between said inlet and said outlet while being symmetric with respect to the axis of said body, said member being of barrel external shape and being defined by two equal radii having centers equidistant from the axis of said member and offset to opposite sides of a common axial plane.

3,926,408

GATE VALVE FOR CONTROLLING FLUID FLOW

Ernst Vogeli, Wiesendange, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

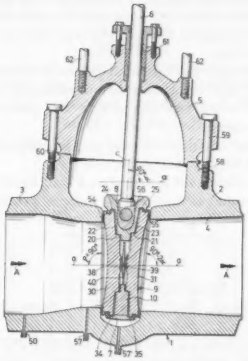
Filed Nov. 6, 1973, Ser. No. 413,380

Claims priority, application Switzerland, Nov. 7, 1972, 16226/72

Int. Cl.² F16K *3/12*

U.S. Cl. 251—327 **13 Claims**

11. A gate valve for controlling fluid flow having an inlet body end including an exit of predetermined cross-section for the fluid flow, an outlet body end including an inlet of a cross-section at least 5% larger than said exit cross-section and a valve gate adjacent and between said inlet and said outlet, said valve gate including two sealing discs, each disc carrying a gate sealing surface, one of said discs having a domed protuberance on a surface facing the other disc and a central disc located between said sealing discs and having a surface facing



said protuberance of a material softer than that of said protuberance and engageable with said protuberance.

3,926,409

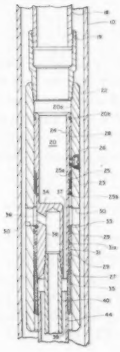
SELECTIVE WELL TREATING AND GRAVEL PACKING APPARATUS

Dave L. Abney; Robert C. Williams, both of Dallas, Tex., and Horace E. Gilbert, Gretna, La., assignors to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 194,228, Nov. 1, 1971, Pat. No. 3,818,986. This application Mar. 18, 1974, Ser. No. 452,234

Int. Cl.² F16K *31/44*

U.S. Cl. 251—344 **4 Claims**



1. A crossover valve apparatus adapted for use in a well bore having a first tubing string and a second tubing string inside a portion of the first tubing string comprising:

a housing having

a first seal bore,

a second seal bore spaced axially from said first seal bore, at least one lateral opening located between said first and said second seal bores;

a tubular mandrel in said housing and movable axially from a first position to a second position in said housing and rotatable in said housing and having

a first seal engaging said first seal bore in both said first and said second positions,

a third seal spaced axially from said first seal and engaging said second seal bore in said second position,

a second seal located between said first seal and said third seal, and engaging said second seal bore in said second position, and

at least one side port located between said second seal and said third seal, and communicating with said at least one lateral opening in said first position; and

releasable means

for locking said mandrel and said housing in one of said first or second positions, and

for permitting said mandrel and said housing to move to the other of said first or second positions.

3,926,410

LOG SKIDDING CONE

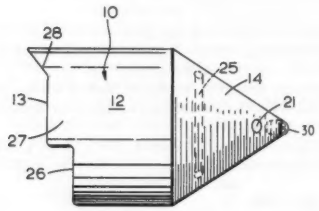
Donald A. McLeod, St. Stephen, New Brunswick, Canada (E0G3A0)

Filed Feb. 19, 1975, Ser. No. 551,297

Claims priority, application Canada, Mar. 7, 1974, 194296

Int. Cl.[2] B60P *1/00;* **A01G** *23/08;* **B66C** *1/34;* **B25B** *29/00*

U.S. Cl. 254—1 **6 Claims**



1. An end guard for use in skidding a log, the guard comprising a cylindrical body open at one end to receive a log to be skidded, the other end of said body being axially convergent to define an aperture of a size sufficient to allow a flexible member to pass therethrough for engaging said log, the open end of said body including a semi-cylindrical extension projecting longitudinally therefrom.

3,926,411

LIFTING JACK

Sheldon D. Tegtmeier, Colfax, N. Dak., assignor to Tegtmeier & Sons, Inc., West Fargo, N. Dak.

Filed Apr. 2, 1975, Ser. No. 564,470

Int. Cl.[2] B66F *7/12*

U.S. Cl. 254—89 R **3 Claims**

1. An elevating jack system for erecting storage silos comprising

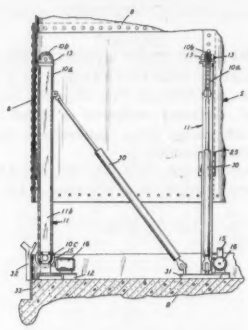
a plurality of elevating mechanisms adapted to be supported by the base platform of the silo structure and including means for laterally stabilizing said mechanisms during the erection operation,

each elevating mechanism including:

a jack attaching lift plate which includes a plurality of inclined cam slots,

a plurality of attaching pins slidably mounted in said cam slots and removably connecting each lift plate to assembled portion of the silo structure, and

means for attaching said lift plate to the respective elevating mechanisms to simultaneously lift all portions of the silo into elevating position while simultaneously rotating the same through a predetermined arc to permit assembly of the next row of silo panels thereunder.



3,926,412

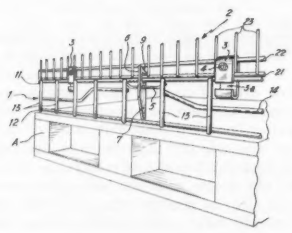
GRAVITY CATCH FOR HINGED GUARD FENCES

Oscar Beretta, Neuilly-sur-Seine, France, assignor to Technifil S.A., Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 438,992, Feb. 4, 1974, abandoned. This application Sept. 26, 1974, Ser. No. 509,660

Int. Cl.[2] B21F *27/00*

U.S. Cl. 256—46 **5 Claims**



1. A guard fence construction comprising upper and lower fence portions, tie piece means hingeably connecting said fence portions together for relative pivotable and translating movement while allowing complete separation of the fence portions, at least one catch member securely connected to one of said fence portions and pivotable relative thereto about a horizontal axis for selectively locking said fence portions both against relative pivotable and translatory movement, said catch member having a center of gravity disposed below the horizontal pivot axis thereof so that the catch member is urged to an active position under the effect of gravity, said catch member including a working part which in said active position engages the other of said fence portions to hold the same and prevent relative pivotable and translatory movement of said fence portions, said working part of the catch member having an outer sloping ramp portion positioned for engaging said other of the fence portions when said fence portions are moved in translation towards one another for engagement to pivot said catch member and allow such engagement whereafter the catch member is free to pivot under the effect of gravity such that said working part lockably engages said other fence portion, said working part of the catch member including a concave portion which in said active position at least partly encloses said other of said fence portions and prevents relative displacement of the fence portions in a direction for separation thereof, and an extension which forms a lever

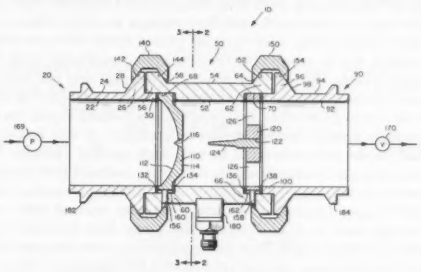
which is operable to move said catch member to a withdrawn inoperative position.

3,926,413

APPARATUS FOR PRODUCING ACOUSTIC VIBRATIONS IN LJQUIDS

Anthony M. D'Urso, New Canaan, Conn., assignor to Sonic Corporation, Stamford, Conn.

Filed Jan. 20, 1975, Ser. No. 542,640
Int. Cl.² B01F *5/06, 11/00*
U.S. Cl. 259—4 R **7 Claims**



1. An apparatus for producing acoustic vibrations in a flowing liquid comprising an inlet section, a body section, and an outlet section,

each of said sections having a substantially cylindrical inner surface and having an outer surface,

a first flange extending radially outwardly from an inlet end of said body section and a second flange extending radially outwardly from an outlet end of said body section,

a first counterbore at the inlet end of said body section and a second counterbore at the outlet end of said body section,

said inlet section being adjacent to said inlet end of said body section and having an axially extending cylindrical flange extending into said first counterbore,

said outlet section being adjacent to said outlet end of said body section and having an axially extending flange extending into said second counterbore,

an orifice plate mounted in said first counterbore and having one face that is substantially spherical and another face that is substantially flat, said orifice plate having an eye-shaped orifice at its approximate midpoint,

a blade plate mounted in said second counterbore, said blade plate having a blade-like vibratory element aligned with said orifice,

an annular sealing ring on each side of said orifice plate in said first counterbore, and annular sealing ring on each side of said blade plate in said second counterbore, each of said annular sealing rings having a substantially cylindrical inner surface,

a flange extending radially outwardly from the inlet section adjacent to the body section,

a flange extending radially outwardly from the outlet section adjacent to the body section,

a first clamping means surrounding the radially extending flanges of the inlet section and the inlet end of the body section to mount said inlet section to said body section, and a second clamping means surrounding the radially extending flanges of the outlet section and the outlet end of the body section to mount said outlet section to said body section,

means for preventing rotation of the orifice plate in the first counterbore,

means for preventing rotation of the blade plate in the second counterbore,

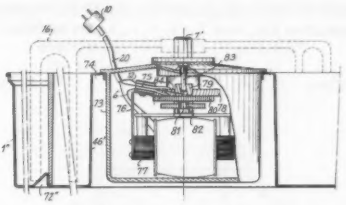
and the inner surfaces of the inlet section, the body section, the outlet section, and the annular sealing rings being substantially equal in diameter and free of any crevices to minimize the possibility of bacteria buildup as the liquid flows through the apparatus.

3,926,414

ICE-BOX

Pierre Tanguy, Daix, France, assignor to Etud, Dijon, France

Filed Jan. 2, 1974, Ser. No. 429,820
Claims priority, application France, Jan. 4, 1973, 73.00210
Int. Cl.² A23G *9/12*
U.S. Cl. 259—108 **7 Claims**



1. In an appliance for making water ices and the like having a motor, an electrical circuit for said motor including a power cable extending from said appliance, reduction gearing and retractable mixing blades driven by said motor, the improvement comprising:

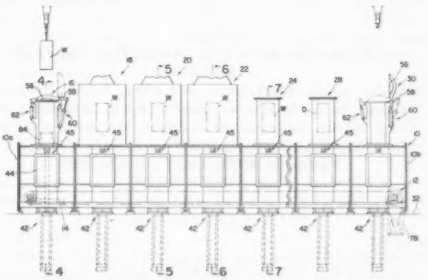
means responsive to retraction of said blades to open said circuit to said motor and connect said circuit to an alarm device, said alarm device being in said power cable and in a position therein remote from said motor whereby it may be positioned externally of the region in which said appliance is located.

3,926,415

METHOD AND APPARATUS FOR CARBONIZING AND DEGASSING WORKPIECES

William W. Konas; Paul L. Day, both of Parma, and Roger R. Budzinski, Seven Hills, all of Ohio, assignors to Park-Ohio Industries Inc., Cleveland, Ohio

Filed Jan. 23, 1974, Ser. No. 435,677
Int. Cl.² C21D *9/00, 1/74*
U.S. Cl. 266—5 E **16 Claims**



1. A heat treating furnace comprising an input station, a heating station, a cooling station and an output station, a vertically fixed carriage movable along a horizontal path relative to said stations, enclosure means for said carriage and including top wall means spaced above said carriage and overlying said path, chamber means at each of said stations supported on said top wall means and opening therethrough, means to heat said chamber means at said heating station, means to position said carriage along said path at each of said stations in alignment with the opening into the chamber means at the corresponding station, workpiece support and chamber closure means separate from and movable with said carriage

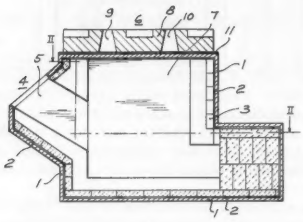
and displaceable vertically from said carriage at each of said stations between a first position on said carriage and a second position spaced from said carriage and closing the opening into the chamber means at the corresponding station, means at each of said stations separate from said carriage and displaceable relative thereto to move said support and closure means relative to said carriage between said first and second positions, and means separate from said carriage to hold said support and closure means in said second position.

3,926,416

ALUMINUM HOLDING FURNACE

Hudson G. Pendry, Chicago, Ill., assignor to The Raymond Lee Organization Inc., New York, N.Y., a part interest

Filed June 3, 1974, Ser. No. 475,845
Int. Cl.[2] F27B 17/00
U.S. Cl. 266—33 R **1 Claim**



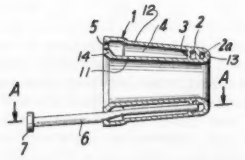
1. An aluminum holding furnace, comprising
a steel housing having a front and a chute-type part extending at an angle downward into the housing from the front, and a top and an opening at the top;
an asbestos lining on the steel in the housing;
heat insulating bricks lining the asbestos in the housing;
burner means for heating the furnace, said burner means comprising a removable top cover for the furnace removably affixed to the housing and covering the opening at the top thereof, the top cover having burner holes formed therethrough flaring outward as they progress toward the inside from the outside; and
an asbestos gasket between the top cover and the housing for making the furnace pressure-tight.

3,926,417

TUYERE FOR BLOWING GAS INTO A MELTING FURNACE

Takehiro Horio, Kitakyushu; Katsuhisa Tsuda, Nakama; Tadashi Imai; Masashi Mitsutsuka, both of Kitakyushu, and Heiji Morise, Fukuoka, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jan. 10, 1974, Ser. No. 432,203
Int. Cl.[2] C21B 7/16
U.S. Cl. 266—41 **6 Claims**



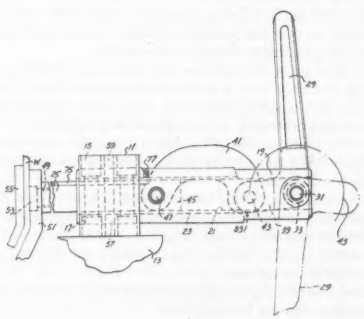
1. A tuyere for blowing gas into a melting furnace comprising an annular inner wall, an annular outer wall laterally enclosing and spaced radially outwardly from said inner wall, a first end wall extending between said inner and outer walls at one end thereof and a second end wall extending between the opposite ends of said inner and outer walls for forming a closed space therebetween, a first partition wall located within the closed space and extending radially between said inner and outer walls transversely of the axis thereof for dividing the closed space into a front cooling chamber adjacent said first end wall and a back cooling chamber extending between said first partition wall and said second wall, wherein the improvement comprises a helically arranged second partition wall located within said front cooling chamber and extending between said inner and outer walls transversely of the axis of said inner and outer walls and forming a flow passage with a plurality of helical turns extending between said first end wall and said first partition wall, said flow passage having a dimension transversely of the axial direction of said inner and outer walls equal to the dimension between said inner and outer walls for the full extent of said flow passage from said first end wall to said first partition wall, first conduit means connected to said front cooling chamber for circulating a cooling liquid therethrough, second conduit means independent of said first conduit means and connected to said back cooling chamber for circulating a cooling liquid therethrough and said first conduit means includes a supply conduit and a discharge conduit with said supply conduit extending from said second end wall through said back cooling chamber, said first partition wall and the turns of said flow passage closer to said first partition wall and opening into the turn of said flow passage closest to said first end wall, and said discharge conduit extending from said second end wall through said back cooling chamber and said first partition wall and opening into the turn of said flow passage closest to said first partition wall.

3,926,418

ROTATING DETENTED PUSH-PULL PLUNGER CLAMP

Leland F. Blatt, 31915 Groesbeck Highway, Fraser, Mich. 48026

Filed May 8, 1974, Ser. No. 468,019
Int. Cl.[2] B25B 1/14
U.S. Cl. 269—13 **6 Claims**



1. A push-pull clamp for anchoring a work piece against a fixture comprising:
a base mounted on a support and having a longitudinal bore;
an elongated cylindrical body projected through said bore and rotatively adjustable upon said base;
said body having a longitudinal bore therethrough of square cross section;
there being an outwardly opening radial slot through said body;
a plunger of square cross section slidably and guidably reciprocated within one end of said body and at one end projecting from the body adapted to retainingly engage a workpiece;

a handle at one end guidably nested in said slot and pivotally mounted upon said body;

a link at one end pivotally connected to said plunger and at its other end pivotally connected to said handle;

and cooperating means on said base and body retaining said body against longitudinal movement relative to said base and detent means on said base and body for restraining said body against rotation when in extreme rotative positions, said body being at all times free to rotate with respect to said base between its detented positions when the plunger is in unclamped position, said cooperating means including an annular groove on said body, and a key nested in said base and extending into said groove.

3,926,419

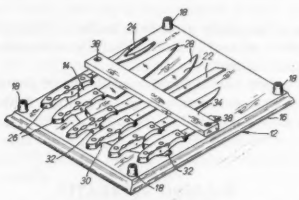
COMBINATION CUTLERY AND CUTTING BOARD

Edwin J. Kenny, 2661B N. Fratney, Milwaukee, Wis. 53212

Filed June 12, 1974, Ser. No. 478,638

Int. Cl.² B25B *11/00*

U.S. Cl. 269—16 **2 Claims**



1. A storage assembly for a cutlery set, the cutlery set including a number of knives and a fork, each having a handle and a blade, said assembly comprising a board, a number of recesses in said board for receiving the handles of the cutlery set, a transverse bar mounted on said board in a transverse position with respect to the blades of the knives and fork, openings in each end of said bar, a pair of spring coils positioned in said openings, and a mounting screw extending through each opening into said board for retaining the coil springs in the openings, said springs being compressed by said screws for biasing the bar against the blades whereby the knives and fork can be easily removed from and replaced in the recesses of the board, and a leg at each corner of said board for supporting said board on a surface at a distance sufficient to provide clearance on the bottom of said board for said cross bar.

3,926,420

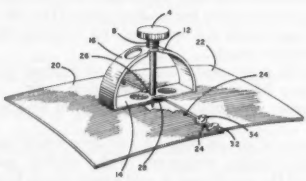
SHEET METAL SECURING DEVICE

Edwin S. Raymond, 1001 N. Main, Las Vegas, Nev. 89101

Filed July 8, 1974, Ser. No. 486,504

Int. Cl.² B25B *5/00*

U.S. Cl. 269—47 **4 Claims**



1. A clamp for securing sheet metal comprising:

a shaft having handle means for manually rotating the shaft at one end thereof and thread means for engaging a bore in the sheet metal at the other end thereof,

brace means adapted to receive the shaft comprising a substantially flat member and an arcuate member structurally spaced from each other, each member having axially aligned holes therein to permit said shaft to pass therethrough, and

biasing means associated with said shaft for urging the sheet metal toward the brace means when the threaded end of the shaft engages the sheet metal.

3,926,421

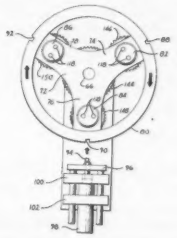
TURRET FOR WORKPIECE

Arthur C. Reiger, Jr., and Hyman B. Finegold, both of Dayton, assignors to The Globe Tool and Engineering Company, Dayton, Ohio

Filed July 5, 1973, Ser. No. 376,518

Int. Cl.² B23Q *7/02;* **H02K** *15/10*

U.S. Cl. 269—57 **3 Claims**



1. Stator frame supporting apparatus for use with a machine for inserting insulators into stator frames wherein there are to be two insulators spaced apart by 180° in the stator frames, said support apparatus comprising a turret rotatable about a predetermined axis and having three stator frame receiving mandrels equally spaced from said axis and spaced circumferentially apart by 120°, unidirectional drive means for indexing said turret in successive increments of 120° each to sequentially position said mandrels at a predetermined position to receive an insulator fed to a stator frame mounted thereon by said machine, and means driven by said drive means for rotating each said mandrel relative to said turret through an odd integral multiple of 180° for each 360° rotation of said turret whereby each stator frame received upon a mandrel is rotated through 180° during the interval it first is moved away from said predetermined position and it next arrives at said predetermined position.

3,926,422

APPARATUS FOR SUPPORTING AND POSITIONING OF A WORK-PIECE DURING WELDING

Bobby R. Wilson, 423 Kline Ave., Akron, Ohio 44305

Filed Oct. 16, 1974, Ser. No. 515,224

Int. Cl.² B23Q *3/18*

U.S. Cl. 269—60 **1 Claim**

1. Apparatus for supporting and positioning of a work-piece during welding, including a base plate having a transverse drive means, a secondary plate carried by said base plate and having at least one drive element engaged by said transverse drive means and a vertically and laterally adjustable mechanism carried by said secondary plate and providing means for engaging a work-piece during welding,

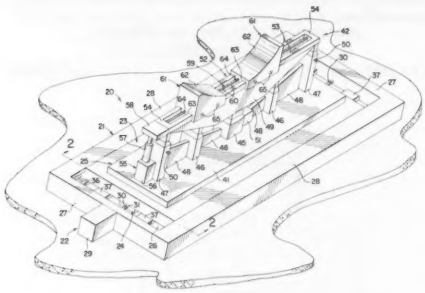
said base plate having opposed guide rails with slots for mating engagement with rib areas on said secondary plate to slidably secure said secondary plate on said base plate and to prevent vertical movement of said secondary plate relative to said base plate,

said transverse drive means comprising an elongate drive screw rotatably supported by said base plate,

each drive element being located on the underside of said secondary plate and having a threaded bore therethrough for threaded engagement by said drive screw, whereby said secondary plate will slide relative to said base plate upon actuation of said drive screw,

said secondary plate having therebeneath dual guide ways for slidably receiving guide keys on said base plate and guiding the sliding movement of said secondary plate relative to said base plate,

said base plate having dual elongated tracks thereon in aligned relation to bearings housed beneath said secondary plate for rolling movement of said secondary plate on said base plate,



said mechanism comprising a saddle carried above said secondary plate, said saddle having an upper portion telescopically received by a lower portion, said upper portion being vertically adjustable by a lifting means housed within said lower portion,

the upper portion of said saddle including a track for slidably carrying the work-piece engaging means and rotatably carrying a second elongate drive screw having double and opposite hand threaded portions,

said work-piece engaging means comprising opposed movable jaws positioned for sliding movement on said track, each jaw having therethrough a threaded bore for engagement by the threaded portions of said second drive screw, whereby said opposed jaws will slide laterally toward or away from one another on said track upon actuation of said second drive screw.

3,926,423

HIGH SPEED IN-LINE PAPER INSERTING APPARATUS AND METHOD

George Merker, Fair Lawn, N.J.; Joseph Krupp, Bangor, Pa.; Charles R. Ricards, Belvidere, N.J., and Thomas A. Ward, Whitehall, Pa., assignors to American Newspaper Publishers Association, Easton, Pa.

Filed Dec. 26, 1973, Ser. No. 427,763

Int. Cl.[2] B65H *5/30*

U.S. Cl. 270—55 **9 Claims**

1. A method of high speed in-line inserting of a supplement insert into a newspaper comprising the steps of:

A. folding a newspaper to provide an extending lap on the top half of said folded newspaper with respect to the bottom half, conveying said folded newspaper as a folded jacket with the folded edge forwardly disposed to a speed up station, and

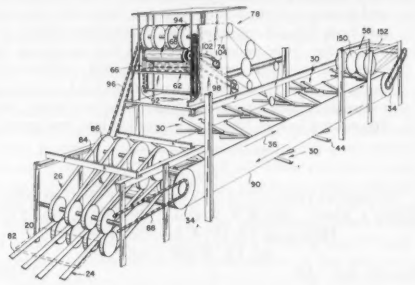
B. accelerating said folded jacket forwardly and downwardly for a rectilinear series of steps wherein said folded edge is rectilinearly conveyed forwardly and downwardly with respect to said extended lap, said rectilinear conveying steps further comprising in sequence:

i. forwardly pivoting said folded jacket relative to said folded edge while rectilinearly conveying and,

ii. maintaining the top half of said jacket in said pivoted position, while rectilinearly conveying and,

iii. backwardly pivoting only said bottom half of said jacket to thereby define a rearwardly and upwardly opening pocket which is rectilinearly conveyed, and

C. impelling an insert forwardly and downwardly into said rearwardly opening pocket, said insert impelling speed



being substantially greater than the rectilinearly conveying speed of said jacket to thereby seat said insert into said pocket, and;

D. backwardly pivoting said top half of said jacket onto said bottom half and rectilinearly conveying a folded composite of said jacket and said supplement insert.

3,926,424

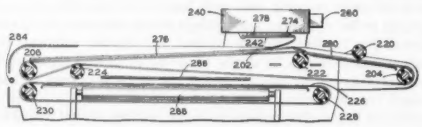
FOLDING APPARATUS

Roland W. Gerstenberger, and William E. Field, both of Fort Lauderdale, Fla., assignors to Jensen Corporation, Fort Lauderdale, Fla.

Continuation-in-part of Ser. No. 266,604, June 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 190,812, Oct. 20, 1971, Pat. No. 3,714,459. This application Dec. 13, 1973, Ser. No. 424,479

Int. Cl.[2] B65H *45/12*

U.S. Cl. 270—62 **6 Claims**



1. A folding apparatus for folding laundry articles and comprising:

means for transporting a laundry article along a predetermined path,

a pick up and drop folder positioned along said path, for folding the article, said folder having a blade for lifting and retaining the leading edge of the article and thereafter dropping said leading edge on the trailing edge of the article as it moves past, and means to raise said blade for lifting and retaining the leading edge of the article and to lower said blade for dropping and releasing the leading edge of the article,

a roll folder positioned along said path beyond said pick up and drop folder for folding the article again,

timer means controlling the operation of said roll folder, and

sensor means at said pick up and drop folder for sensing successively the movement of the leading and trailing edges of the article past it, said sensor means being operably coupled to both said pick up and drop folder and said timing means for the roll folder:

a. to cause said blade in the pick up and drop folder to be raised in response to the movement of the leading edge of the article past said sensor means;

b. to cause said blade to be lowered in response to the movement of the trailing edge of the article past said sensor means; and

c. in response to the movement of the leading and trailing edges of the article in succession past said sensor means, to actuate said timer means to cause said roll folder to fold the article as it moves past;

said sensor means comprising a leading sensor positioned to sense the leading edge of the article before it reaches said blade, and a trailing sensor positioned to sense the leading edge of the article after it reaches said blade, and further comprising relay means responsive to both the leading sensor and the trailing sensor to cause the blade in the pick up and drop folder to be raised when both sensors have sensed the leading edge of the article.

said relay means including contacts for automatically disconnecting the same from said trailing sensor after the latter senses the leading edge of the article and for atuomatically reconnecting the same to said trailing sensor after the leading sensor senses the trailing edge of the article, said relay means having further contacts;

said timer means including capacitance means adapted to be electrically charged and discharged, and control circuit means actuated by said further contacts of said relay means for charging said capacitance means at a slow rate beginning with the movement of the leading edge of the article past the trailing sensor and at a quadrupled rate beginning with the movement of the trailing edge of the article past the leading sensor so as to time the operation of said roll folder for folding the once-folded article again at the middle.

3,926,425

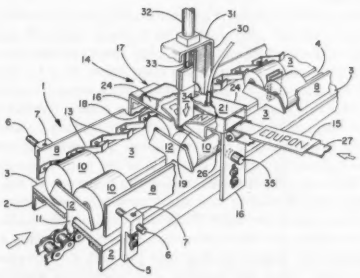
METHOD OF COUPON POSITIONING AND MECHANISM THEREFOR

Allan A. Pierce, New Milford; Christian M. Peterson, Brookfield, both of Conn., and Jerry G. Kunde, Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed June 27, 1974, Ser. No. 483,640

Int. Cl.² B65H *45/18*

U.S. Cl. 270—83 **3 Claims**



1. In coupon positioning mechanism for inserting coupons between roll products, support means for a coupon, said support means having a slot therein, means for moving a pair of roll products with their peripheries in contact and their axes parallel beneath the support means so that the zone of contact of the roll product peripheries is in vertical alignment with and extends parallel to the slot of the support means, means for delivering coupons one at a time to said support means to extend transversely across said slot, a reciprocable plunger mounted above said support means operably positioned in alignment with said slot to tuck a coupon on said support means through said slot and between said roll products at the zone of contact of the roll peripheries, means to drive said plunger vertically in reciprocation, said support means for the coupon having a first generally horizontal portion and a second portion also generally horizontal and nearer the means for delivery of coupons which second portion at said slot projects slightly above said first portion so that coupons delivered to said support means slide smoothly across said slot.

3,926,426

SHEET INSERTION AND REMOVING DEVICE

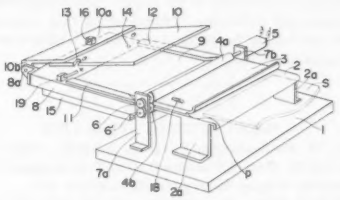
Shiro Toriumi, and Seiichi Yamagishi, both of Tokyo, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 27, 1974, Ser. No. 527,767

Claims priority, application Japan, Dec. 3, 1973, 48-136296; Mar. 4, 1974, 49-25443

Int. Cl.² B65H *5/04*

U.S. Cl. 271—3 **11 Claims**



1. In a sheet insertion and removing device for use in microfilm readers or the like apparatus which comprises a sheet carrier including means for positioning a sheet supplied thereon in a required position and means for holding said sheet on said carrier for retrieval of data stored on said sheet, an improvement thereof for automatic insertion and removing of the sheet into or from said carrier comprises feeding means for sheet feeding, a guide member forming a passage for said sheet, a carrier member provided thereon with sheet positioning means and sheet holding means and adapted to reciprocate relative to said guide member, an upper surface of said carrier member being adapted to be level with that of said guide member, first switch means provided in said passage on said guide means and actuated by insertion of said sheet into said passage for causing said feeding means to feed said sheet onto said carrier member, second switch means for driving said carrier member forward away from a starting position to a predetermined position which second switch means is disposed on said carrier member and actuated when said sheet has been positioned on said carrier member, said carrier member being adapted to stop at said predetermined position during retrieval of said data stored on said sheet and to subsequently return back to said starting position, third switch means disposed between said carrier member and said guide member so as to be actuated when said carrier member has returned to said starting position for causing said feeding means to discharge said sheet back onto said guide member.

3,926,427

APPARATUS FOR SEPARATING SHEETS FROM A STACK

Stephen L. Moksnes, 970 W. Highland St., and F. Leslie Moksnes, 125 S. Fourth St., both of Whitewater, Wis. 53190

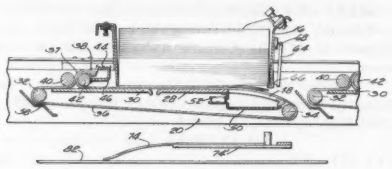
Filed Feb. 14, 1974, Ser. No. 442,527

Int. Cl.² B65H *3/12*

U.S. Cl. 271—9 **6 Claims**

5. Apparatus for separating sheets from a stack comprising a fixed hopper for a stack of sheets, a shuttle mounted for movement below said hopper and having a transverse gap therein, belt means having opposite loop portions forming an anti-friction support for the sheets of the stack extending over and around said shuttle and having a portion secured in fixed position above the shuttle and adjacent the hopper, means connected with said shuttle and responsive to movement of the shuttle for causing downward deflection of an end portion of the bottommost sheet in the stack into said transverse gap, roller means in each of the opposite loop portions of said belt

means, and means for reciprocating the shuttle in a direction to cause the roller means to shift the belt means from a position where the major portion of the length of the belt means is beneath the hopper to a position where the major portion



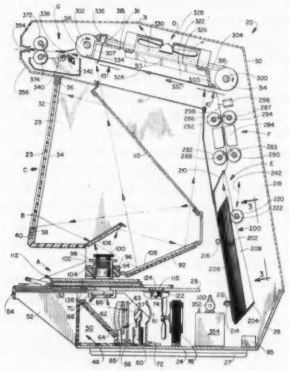
of its length is forwardly of the hopper, said means for causing said downward deflection comprising suction cups mounted on said belt means for shifting movement with the belt as the belt means is shifted.

3,926,428

SHEET FEEDING APPARATUS

Stanley W. Heldenbrand; David L. Johnson, both of Dallas, and Neil H. Mote, Richardson, all of Tex., assignors to Seaco Computer-Display Incorporated, Garland, Tex.

Division of Ser. No. 166,953, July 28, 1971, Pat. No. 3,811,769. This application Sept. 28, 1973, Ser. No. 401,820
Int. Cl.[2] B65H *1/02, 3/06*
U.S. Cl. 271—109 **1 Claim**



1. Apparatus for feeding individual sheets of paper of the type having an electrically conductive coating on one side thereof from a stack of such paper, said apparatus comprising:

a. tray means supporting and containing said stack and including a base, rear wall, and side walls,

b. said rear wall being inclined at an acute angle with respect to said base, thereby to position the top sheet of said stack forwardly from the remainder of said stack,

c. roller means for frictionally engaging the top sheet of said stack and urging said top sheet in a forward direction away from said rear wall and parallel to the plane of said stack,

d. deflector means intersecting said base at an obtuse angle thereto and forward of said roller means, said deflector means having an electrically conductive portion adapted to be engaged by the conductively coated side of said top sheet when it is urged in said forward direction for discharging electrostatic charges on said coated side of said top sheet, said electrically conductive portion being sufficiently forwardly spaced from said stack to be out of physical contact with any of the sheets of said stack prior to said urging,

e. means electrically grounding said electrically conductive portion, and

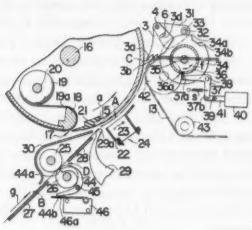
f. electrically insulating material disposed on the inside surfaces of said tray electrically isolating said electrically conductive portion of said deflector means from said stack.

3,926,429

COPY SHEET STRIPPING DEVICE

Toyokazu Satomi, Yokohama; Yasumori Nagahara, Yokosuka, and Teruo Narita, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1973, Ser. No. 417,934
Claims priority, application Japan, Dec. 2, 1972, 47-120829
Int. Cl.[2] B65H *29/56*
U.S. Cl. 271—174 **4 Claims**



1. A copy sheet stripping device for use with an electrophotographic apparatus of the type comprising a movable member adapted to carry an intermediate image thereon and move through a transfer-printing station where the intermediate image is printed on a copy sheet by transfer-printing, such device comprising:

a. sheet pick-off claw means disposed in a sheet stripping station for picking off from said movable member the copy sheet on which the intermediate image has been printed;

b. sheet pick-off claw means control means for moving said sheet pick-off claw means to a sheet pick-off position before the leading end of the copy sheet reaches the sheet stripping station so that the copy sheet may be stripped off the movable member, said control means comprising a rotatable cam and a pick-off claw means control member adapted to be moved in pivotable motion by said cam after the lapse of a predetermined time interval; and

c. sheet detection means disposed in the path of movement of the copy sheet for detecting the presence of the copy sheet and actuating said sheet pick-off claw means control means as the copy sheet moves along the path of its movement, said sheet detection means comprising a lever having one end extending into the path of movement of the copy sheet and another end positioned against said rotatable cam for controlling cam rotation by the pivotable movement of said lever.

2. A copy sheet stripping device for use with an electrophotographic apparatus of the type comprising a movable member adapted to carry an intermediate image thereon and move through a transfer-printing station where the intermediate image is printed on a copy sheet by transfer-printing, said device comprising:

a. sheet pick-off claw means disposed in a sheet stripping station for picking off from said movable member the copy sheet on which the intermediate image has been printed, said claw means comprising:

i. a plurality of claw members, each having a free end formed in sawtooth fashion;

ii. means for supporting each of said claw members for individual pivotal movement about a common axis; and

iii. means for urging said claw members in pivotal

movement about said common axis toward their respective sheet pick-off positions whereat the leading end of the transfer-printed copy sheet on the movable member is received in one of the valleys of the sawteeth on each of the claw members so as to move said claw members in pivotal motion against the action of said urging means;

b. cam means for normally inhibiting said claw members from assuming their sheet pick-off positions until immediately before the leading end of the copy sheet reaches the sheet stripping station and for thereupon releasing said claw members to permit them to assume their sheet pick-off positions so that the copy sheet may be stripped off the movable member, said cam means comprising:

i. a rotatable cam; and

ii. drive means for rotating said cam through a frictional force at a predetermined rate;

c. means for locking said rotatable cam in a predetermined angular position against the action of said frictional force;

d. sheet detection means, including an actuator disposed in the path of movement of the copy sheet at a position before the sheet stripping station, for producing a detection signal when said actuator is engaged and pushed by the leading end of the copy sheet; and

e. means for actuating said locking means in response to said detection signal to release said rotatable cam thereby permitting said claw members to assume their respective sheet pick-off positions.

3,926,430

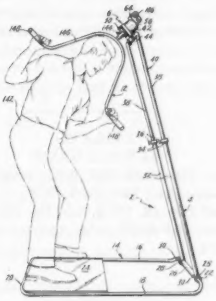
GOLF EXERCISER DEVICE

Lewis B. Good, Jr., 145 Johnson, East Peoria, Ill.

Continuation-in-part of Ser. No. 169,701, Aug. 6, 1971, abandoned. This application Nov. 15, 1973, Ser. No. 416,239

Int. Cl.[2] A63B *21/22, 23/02*

U.S. Cl. 272—79 C **22 Claims**



1. An exercise device for use by golfers to exercise and strengthen all of the principal muscle groups utilized in making a golf swing, comprising: a hydraulic resistance unit including an operating shaft, and designed to produce resistance torque smoothly and in proportion to the speed of the operating shaft; support means for supporting said hydraulic resistance unit generally at or above shoulder height of a golfer using said device; and force transmitting means attachable to said operating shaft, and arranged to be engaged by said golfer for transmitting muscular force to said operating shaft, said force transmitting means comprising: a generally L-shaped handle attachable at its upper end to said operating shaft generally at shoulder height, and including grip means on its lower end that is graspable by said golfer, said L-shaped handle being mainly used for exercising the hands, arms and upper body muscles; and a cross-bar member that is attachable at the middle portion thereof to said operating shaft above shoulder height for rotation about a downwardly directed axis of rotation, and including means on the opposite ends thereof engageable by said golfer, said cross-bar member being mainly used for exercising the legs and lower body muscles, said L-shaped handle and said cross-bar member being attached alternatively to said operating shaft, and together providing for full exercising of all the principal muscle groups utilized in playing golf.

3,926,431

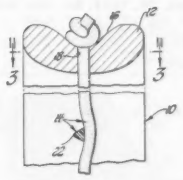
RACKET

John Z. DeLorean, Bloomfield Hills, Mich., assignor to John Z. DeLorean Corporation, Bloomfield Hills, Mich.

Filed July 5, 1974, Ser. No. 486,252

Int. Cl.[2] A63B *51/02*

U.S. Cl. 273—73 D **9 Claims**



1. A racket including a frame and a plurality of string elements supported upon said frame in a taut open weave pattern, each string element including first and second discrete portions extending substantially throughout the length thereof, the first discrete portions of said string elements coacting to form a first ball-engaging surface, the second discrete portions of said string elements coacting to form a second ball-engaging surface, said first ball-engaging surface having a high coefficient of friction relative to said second ball-engaging surface.

3,926,432

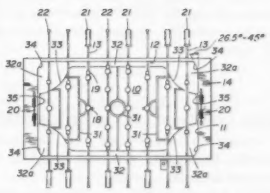
TABLE SOCCER OR FOOTBALL GAME STRUCTURE

Robert L. Furr, and Robert I. Hayes, Jr., both of 4215 Oaklawn Ave., Dallas, Tex. 75219

Filed June 18, 1973, Ser. No. 370,915

Int. Cl.[2] A63F *7/06*

U.S. Cl. 273—85 D **16 Claims**



1. A table soccer or football game structure of the type having a playing field portion surrounded by raised opposite side walls and raised end walls, a plurality of actuating rods extending through said opposite side walls spaced transversely of and above said playing field portion and supporting game figures thereon depending adjacent said playing field portion and adapted to contact a ball thereon, said actuating rods being rotatively and axially movable relative to said side walls, the improvement comprising a solid layer of material covering said playing field portion, said layer of material having an upper playing surface formed with a multiplicity of raised pebbles arranged in a fixed, selected, regular pattern throughout the entire playing field to increase the speed and linearity of the playing field ball thereon in at least three directions.

16. An improved table soccer or football game structure of the type having a playing field portion bounded by raised opposite side walls and raised opposite end walls, a plurality of spaced, parallel actuating rods rotatively and axially movable with respect to said side walls above said playing field portion for supporting a plurality of game figures thereon, the center of gravity of each game figure being offset from the axis of its associated actuating rod, wherein the improvement comprises:

means associated with each game figure for positioning its center of gravity coincidently with the axis of its associated actuating rod.

3,926,433

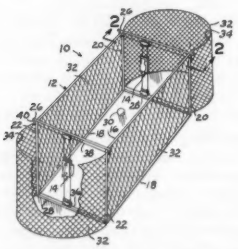
PADDLE BALL GAME APPARATUS

Paul E. Jacques, 215 East St., North Attleboro, Mass. 02760

Filed Jan. 20, 1975, Ser. No. 542,536

Int. Cl.[2] A63F *7/00*

U.S. Cl. 273—85 F **5 Claims**



1. A paddle ball game apparatus, comprising:

a three dimensional open frame defined by a pair of vertically upstanding and spaced apart parallel side members and a pair of vertically upstanding and spaced apart parallel end members;

means enclosing each of said side members and each of said end members, respectively, to define a paddle ball game court having a goal at each end located behind the said end members;

a game ball; and,

a paddle means supported by said end members in front of each said goals for striking said ball, each of said paddle means being mounted for selective reciprocative movement vertically and for selective reciprocative movement horizontally within the vertical plane defined by each of said end members.

3,926,434

REMOTE CONTROLLED VEHICLE SYSTEMS

Thomas C. Cannon, Jr., Dunwoody, Ga., assignor to Thomas C. Cannon, Jr., Dunwoody, Ga. and Brent E. Coy, Morristown, N.J., part interest to each

Filed Apr. 19, 1974, Ser. No. 462,334

Int. Cl.[2] A63H *18/12*

U.S. Cl. 273—86 B **23 Claims**

1. In a remotely controlled vehicle system comprising in combination at least one electrically powered vehicle including driving means which is continuously energized from a remote source of power through oppositely polarized contacts,

track means comprising a repetitive pattern of conductors superimposed along a surface on which said vehicle travels, and including:

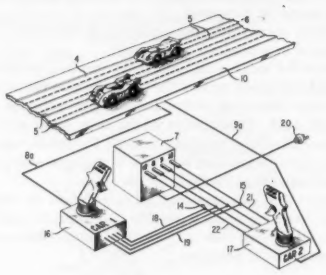
a first set comprising a plurality of said conductors uniformly spaced apart on said surface,

a second set comprising conducting means interposed between and electrically isolated from successive conductors of said first set along said surface,

the conductors of said first set and the second conducting means being connected to opposite terminals of said remote source of power for oppositely polarizing said first set relative to said second set,

first and second contacting means fastened on said vehicle in circuit relation to opposite terminals of said driving means, said contacting means constrained to move relative to said vehicle only in a direction substantially normal to the surface of said track,

said first contacting means connected to one said terminal comprising a contacting surface constructed to make slidable electrical contact with one or more conductors of



said first set simultaneously without making electrical contact with the intervening conducting means of said second set, and

said second contacting means connected to the other said terminal, constructed to make slidable electrical contact with the intervening conducting means of said second set without being electrically responsive to the conducting means of said first set, each of said second contacting means so disposed relative to said first contacting means that when said first contacting means is in contact with one or more conductors of said first set at least one of said second contacting means is in contact with the intervening conducting means of said second set.

3,926,435

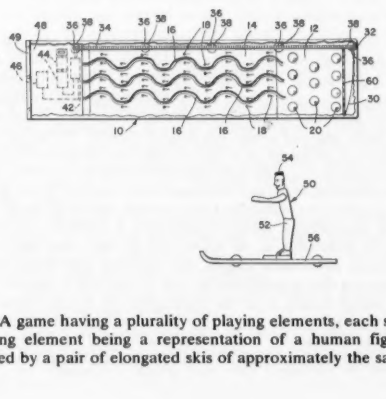
SKI RACE GAME

Valentine Nacci, Richmond Hill, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed July 18, 1974, Ser. No. 489,569

Int. Cl.[2] A63F *9/14*; **A63H** *15/02*

U.S. Cl. 273—86 C **3 Claims**



1. A game having a plurality of playing elements, each said playing element being a representation of a human figure carried by a pair of elongated skis of approximately the same

scale as said figure, each of said skis having a pair of wheels disposed along the longitudinal axis of said ski and in aligned relationship thereto, one of said skis of each pair being substantially heavier than the other, and a game board having a first playing surface substantially horizontal and a second playing surface inclined upwardly therefrom, said second surface having a plurality serpentine tracks disposed thereon, each of said tracks being sized for accommodating a pair of said skis.

3,926,436

SILVER HALIDE ELEMENT CONTAINING POLYMERIC COLOUR FORMING COUPLERS

Marcel Jacob Monbaliu, Neuris 9; Jan Jozef Priem, Kapellelei 27, both of B 2510 Mortsel, and Roger Henri Vrydaghs, Hertogenlaan 35, B 2070 Ekeren, all of Belgium

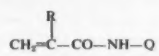
Filed Feb. 15, 1974, Ser. No. 443,118

Claims priority, application United Kingdom, Feb. 26, 1973, 9421/73

Int. Cl.² G03C *1/40, 1/72*

U.S. Cl. 96—67 **9 Claims**

1. A photographic colour element comprising a support and at least one light-sensitive silver halide emulsion layer wherein the element comprises a copolymer latex containing recurring units derived from a first ethylenically unsaturated monomer which will undergo oxidative coupling with an aromatic primary amino compound corresponding to the formula:

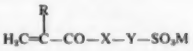


wherein:

R is hydrogen, C_1–C_4 alkyl or chlorine, and

Q is a moiety which will undergo oxidative coupling with an aromatic primary amino compound,

and recurring units derived from a second monomer corresponding to the formula:



wherein:

R is hydrogen, C_1–C_4 alkyl or chlorine,

X is —O— or —N(R′)— wherein R′ is hydrogen or lower alkyl,

Y is a divalent hydrocarbon group which may be interrupted by oxygen and/or sulphur, and

M is a cation.

9. A photographic element according to claim **1**, wherein the said polymeric compound is a polymeric competing coupler and is present in an intermediate non-light-sensitive water-permeable colloid layer of the photographic element.

3,926,437

VERTICAL GAME BOARD AND PLAYING PIECES INCLUDING MOVE SETTING MECHANISMS

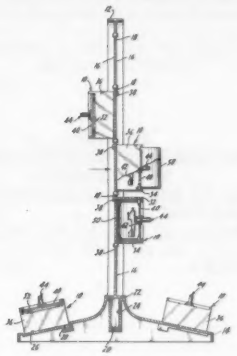
Walter Moe, Huntington Station, Long Island, and Michael Meyers, Fort Salonga, both of N.Y., assignors to Aurora Products Corporation, West Hempstead, N.Y.

Filed Dec. 20, 1973, Ser. No. 426,550

Int. Cl.² A63F *3/00*

U.S. Cl. 273—131 B **18 Claims**

1. A game apparatus comprising a playing board common to the players and playing pieces adapted to be mounted for movement across said playing board, each of said playing pieces including player controlled means for presetting said playing piece in a selected direction of movement and means for selectively concealing said playing piece to prevent prema-



ture discovery of the preset selected direction of movement for the playing piece.

3,926,438

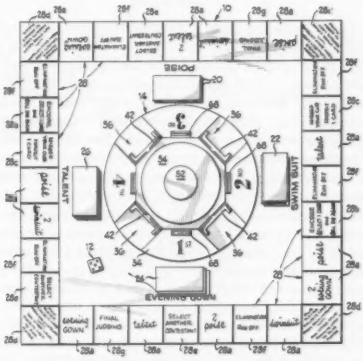
BOARD GAME APPARATUS UTILIZING TWO CHANCE DEVICES

Jeffrey D. Breslow, Highland Park, and Bette M. Kaelin, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Division of Ser. No. 385,397, Aug. 3, 1973, Pat. No. 3,861,686. This application Nov. 27, 1974, Ser. No. 527,631

Int. Cl.² A63F *3/00*

U.S. Cl. 273—134 C **7 Claims**



1. In a board game including a plurality of playing pieces, one for each player of the game, a game board having a plurality of playing stations thereon defining a playing piece path of travel, each playing station having indicia thereon, and a first chance device for determining the number of playing stations a particular playing piece is to advance on the game board, whereon the improvement is a second chance device comprising:

a housing adapted to be supported on said game board;

means defining a plurality of chance stations formed on the outside of said housing, at least one chance station for each player of the game;

a plurality of chance pieces, at least one for each player of the game, adapted to be positioned at said chance stations; and

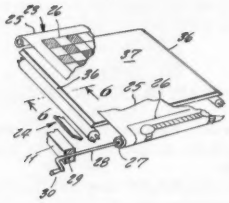
random selection means mounted on said housing operably associated with said chance stations and engageable with said chance pieces when positioned at chance stations for

randomly and physically altering the disposition of one chance piece at one station thereby signifying the attainment or failure to reach a predetermined goal.

3,926,439
LUMINATED TABLE TOP WITH MULTIPLE GAMES ROLL CHART

Albert L. Chao, and Ethel Chao, both of 407 Glendale Road, Northvale, N.J. 07647

Filed Nov. 29, 1974, Ser. No. 528,249
Int. Cl.² A63F *3/02*
U.S. Cl. 273—136 A **1 Claim**

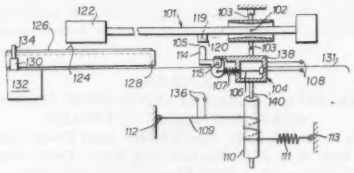


1. In a luminated table top with multiple game roll chart device, the combination of a square frame and a pair of square, clear, plastic panels upon said frame, a lower of said panels having a transluscent, decorative outer border area on an underside thereof, an opague, white inner border area adjacent an inner edge of said outer border area, and a central square clear area surrounded by said white inner border area, and interengagable snap fastener elements being mounted on both said plastic panels, said snap fastener elements being located near the peripheries of said panels for detachably attaching said panels together, a perforated panel secured to an underside of said frame defining a central chamber surrounded by said frame, a plurality of blocks mounted on an underside of said perforated panel, said chamber containing a multiple game roll chart assembly and an illumination assembly, said roll chart assembly comprising an elongated chart on transluscent, rollable material imprinted with a plurality of playing fields of various games, opposite ends of said chart being rolled up on a pair of spaced apart rollers, each said roller being secured on a rod rotatably supported in bearings in said frame, one end of each said rod extending externally of said chamber and being bent into a crank handle, said illumination assembly comprising four fluorescent lamps underneath said opaque white inner border area, an elongated, flat mirror along a side of each said lamp, each said mirror being located underneath said edge between said transluscent, decorative outer border area and said opaque, white inner border area, each said mirror being angularly inclined respective to a flat plane of said frame, light from said lamps being reflected by said mirrors upwardly against an underside of said transluscent, outer border area, a light transmitting panel under an unrolled portion of said chart that is located between said rollers, two opposite edges of said light transmitting panel being angularly inclined and coated with a mirror silver, said silver coated edges each being above one said lamp, said lamps being in an electric circuit with a switch and a power source.

3,926,440
RECORD PLAYERS

John Pelham Wren, Swindon, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Aug. 19, 1974, Ser. No. 498,812
Claims priority, application United Kingdom, Aug. 21, 1973, 39452/73
Int. Cl.² G11B *17/06*
U.S. Cl. 274—14 **3 Claims**

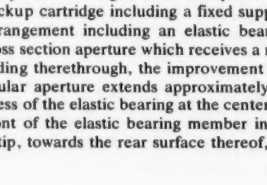


1. A record player comprising a record turntable for receiving a record, a motor for driving said record turntable, a pickup for engaging said record, and a pickup arm which supports said pickup, said pickup arm being movable in a first mode backwards and forwards across said record turntable and in a second mode up and down so that said pickup can be moved into and out of engagement with a said record on said record turntable, said movement of said pickup arm in at least one of said first and second modes being effected by electromechanical means including an elongate conductive element, connection means for operationally connecting said conductive element with said pickup arm and means for enabling an electric current to be applied to said conductive element, said conductive element being such that it becomes hot and elongates under the effect of said electric current and cools and contracts when said electric current is discontinued, and said pickup arm being caused by said connection means to move one way consequent upon said elongation of said conductive element and said pickup arm being caused by said connection means to move the other way consequent upon said contraction of said conductive element.

3,926,441
STYLUS SHOE SUSPENSION ARRANGEMENT FOR A PHONOGRAPH PICKUP CARTRIDGE

Tadatoshi Hibi, and Keniti Okura, both of Fukuroi, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 14, 1974, Ser. No. 469,725
Claims priority, application Japan, May 15, 1973, 48-56831
Int. Cl.² G11B *3/02*
U.S. Cl. 274—37 **4 Claims**



1. In a suspension arrangement for a stylus shoe for a phonograph pickup cartridge including a fixed support, said suspension arrangement including an elastic bearing having a circular cross section aperture which receives a rod-like stylus shoe extending therethrough, the improvement wherein:

said circular aperture extends approximately one-half the thickness of the elastic bearing at the center thereof from the front of the elastic bearing member in terms of the stylus tip, towards the rear surface thereof,

a star-shaped recess is provided within the rear surface of the elastic bearing member emanating from and coaxial with said circular aperture and having points tapering radially outwardly toward the rear face of said elastic bearing member, the radially inside corners of said star-shaped recess contact and support said stylus shoe from said circular aperture to the rear end face of the bearing member, and

a wire coupled at one end to said fixed support rearwardly of the elastic bearing member and to the side of the rod-like stylus shoe and the other end fixed to said shoe at a point where the star-shaped recess merges with the circular aperture with said wire inclined relative to the axis of the rod-like stylus shoe and aligned with one apex of said star-shaped recess such that the resulting wire tension maintains the vibration fulcrum of the stylus shoe at the center of the elastic bearing to effectively prevent the resonant vibration of said stylus shoe.

3,926,442

SLIDING RING SEAL

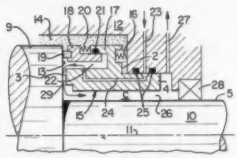
Heinz Konrad Müller, Stuttgart, Germany, assignor to Sealol, Inc., Warwick, R.I.

Filed Oct. 16, 1973, Ser. No. 406,880

Claims priority, application Germany, Oct. 28, 1972, 2253512

Int. Cl.² F16J *15/34*

U.S. Cl. 277—3 **7 Claims**



1. A sliding ring seal for sealing an operatively rotating shaft within a fixed housing against pressure fluid loss, said rotating shaft having an increased diameter portion, provided with a radial face, and a lesser diameter, said housing having a chamber an inlet duct and an outlet duct connecting said chamber with the outside of said housing, said shaft rotatably mounted in said housing, a buffer-fluid pressure control ring, located in said chamber and around said lesser diameter, having a body provided with a radially outwardly extending flange, having a rear surface and a tail portion, said flange forming a pressurized fluid space within said body, and an internal passage in said body connecting said inlet duct with said pressurized fluid space, and a radial end face opposite said radial face providing a control clearance therebetween, fluid sealing means between said tail portion and said housing on opposite sides of said inlet duct connected with said internal passage, an annular primary face seal in telescopic sliding engagement with said flange having a sealing face, a resilient means urging said sealing face into fluid tight relationship with said radial face, a secondary fluid tight seal between said flange and said annular primary face seal, said annular primary face seal and said buffer-fluid pressure control ring dividing said chamber into a pressure fluid space and a pressurized fluid space, whereby, pressurized fluid passing through said inlet duct and internal passage to said pressurized fluid space, flows through said control clearance to and through said outlet duct, pressurized fluid being operatively fed to said control clearance at a constant flow rate in opposition to the pressure of the pressure fluid acting axially on said buffer-fluid pressure control ring whereby the pressure of the buffer-fluid pressure control ring is regulated in direct proportion to the pressure on the pressure fluid by variation in the effective width of the control clearance.

3,926,443

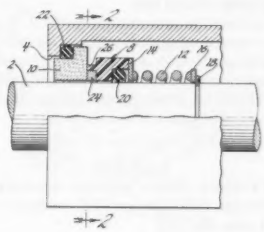
COMPOSITE SEAL RING AND ASSEMBLY

Michael J. Fenerty, Boulder, and David L. Mustoe, Wheatridge, both of Colo., assignors to Coors Porcelain Company, Golden, Colo.

Filed Mar. 5, 1974, Ser. No. 448,328

Int. Cl.² F16J *15/34*

U.S. Cl. 277—96 **7 Claims**



1. A seal ring assembly comprising a pair of seal rings having axial end faces in abutting slidable engagement with each other, each of said end faces being formed at least in part of substantially non-porous hard ceramic material selected from the group consisting of alumina ceramic and magnesia-alumina spinel and at least one of said end faces being formed in part of a softer solid material selected from the group consisting of the organic resins, amorphous carbon, graphite, and mixtures thereof, the hard ceramic of one axial end face being in continuous contact with the hard ceramic and with the softer solid material of the other axial end face.

3,926,444

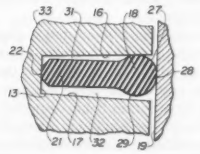
SEAL RING

William B. Gripe, Concord, and Melvin H. Norman, Oakland, both of Calif., assignors to Amot Controls Corporation, Richmond, Calif.

Filed Aug. 27, 1973, Ser. No. 391,679

Int. Cl.² F16J *9/00*

U.S. Cl. 277—177 **2 Claims**



1. A seal ring structure comprising:

telescopically mounted axially displaceable parts; one of said parts being formed with a ring groove having a root wall and opposed side walls divergently tapered from said root wall; the other of said parts being formed with a cylindrical surface opposed to said groove;

a seal ring of elastomeric material mounted in said groove and comprising a torus portion of segmental circular cross section having a diameter less than the width of said groove between said side walls and juxtaposed to said side walls and extending from said groove for engagement with said cylindrical surface, and an annular flexible and compressible web secured concentrically to and integrally formed with said torus portion and extending radially therefrom; said web having a thickness less than the diameter of said torus portion and being joined to said torus portion at its center plane thereby leaving a free torus portion at its center plane thereby leaving a free

torus portion periphery comprising a circular segment greater than 180° to provide three perpendicularly related arcuate sealing surfaces providing line contacts with said groove side walls and said cylindrical surface, the radial extension of said web from said torus portion being at least equal to the diameter of said torus portion, the elastomeric material forming said torus portion and web having a durometer of about 60 to 80 Shore A hardness; said ring defining with said groove side walls chambers on opposite sides of said web;

lubricant mounted in said chambers;

said web co-functioning with said groove side walls to displace lubricant to said arcuate sealing surfaces; and

the ring diameters of said torus portion and said web providing simultaneous pressure set against said cylindrical surface and said root wall respectively.

3,926,445

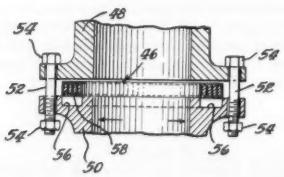
CONVOLUTELY WOUND GASKET

Robert G. Farnam, New Lisborn, Wis., assignor to F. D. Farnam Co., Lyons, Ill.

Division of Ser. No. 250,193, May 4, 1972, Pat. No. 3,890,183, which is a continuation-in-part of Ser. No. 840,171, July 9, 1969, Pat. No. 3,697,348. This application Sept. 26, 1973, Ser. No. 401,116

Int. Cl.² F16J *15/02*

U.S. Cl. 277—204 **6 Claims**



1. A washer type gasket comprising:

a planar body of closed marginal configuration defining an open center, and inner marginal rim in circumambient relation about the body center and an outer marginal rim in circumambient relation about the body,

said body comprising:

a layer of gasket material convoluted in multiply form about the body center to define a gasket material convolution having one end of the layer adjacent the body inner rim and the other end of the layer adjacent the body outer rim, with the convolution being disposed so that the width dimension of said layer extends normally of the plane of said body, the thickness dimension of said layer extends in the plane of said body, and the length dimension of said layer between said ends thereof lies about and coincident with said convolution,

said layer between its said ends being continuous and uninterrupted about said convolution and defining opposed side surfaces facing respectively inwardly and outwardly of the body relative to its center, in the plane of said body, and opposed side edges facing normally of the plane of said body,

and a continuous and uninterrupted layer of fluid impermeable polymeric material between and bonding together the juxtaposed side surfaces of said gasket material layer, said layer of fluid impermeable polymeric material coating and being in sealing relation to said gasket material layer side surfaces uniformly thereacross for the length of said gasket material layer between said ends thereof,

with said gasket material layer between said side surfaces thereof and across its said thickness dimension being free of impregnation with said polymeric material for the length of said gasket material layer whereby said polymeric layer is discrete relative to said gasket material layer,

and with said layer of fluid impermeable material being of uniform thickness across said gasket material side surfaces of the length of said gasket material layer,

said layer of polymeric material comprising adjacent stratums of said polymeric material extending congruently with and respectively adhered to the respective juxtaposed gasket layer side surfaces and uniformly bonded together,

said layer of gasket material including therein, between said ends thereof and across the width dimension thereof reinforcing fibers some of which extend longitudinally of said gasket material layer length dimension and others of which extend laterally of said gasket material layer along said gasket material layer width dimension and in the direction of said side edges thereof,

with said longitudinally extending fibers and said laterally extending fibers being in a ratio of approximately 2 to 1, respectively.

3,926,446

MULTIPLE-JAW POWER CHUCK

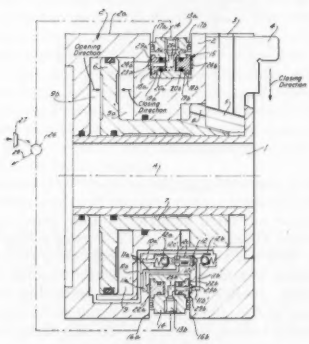
Gunter Horst Rohm, Heinrich-Rohm-Str. 50, 7927 Sontheim, Germany

Filed June 12, 1974, Ser. No. 478,683

Claims priority, application Germany, June 22, 1973, 2331863

Int. Cl.² B23B *31/30*

U.S. Cl. 279—4 **8 Claims**



1. A chuck comprising

a housing adapted to be rotated about an axis and formed with at least one fluid chamber having two sides, a circumferential groove having a pair of axially spaced confronting side faces, and at least one housing passage having one end opening at one of said sides into said chamber and another end opening at one of said side faces of said groove;

a plurality of angularly spaced jaws radially displaceable on said housing;

an axially displaceable piston in said chamber between said sides subdividing said chamber into a pair of compartments;

cam means between said piston and said jaws for radial displacement of said jaws by axial displacement of said piston,

a distributing ring rotatably received in said circumferential groove and having a pair of opposite axial ends each confronting a respective side face, at least one of said axial ends being formed with an annular seal groove confronting said one side face, said ring being formed with at least one passage having one end opening at the base of said seal groove and having another end adapted

to be connected to an external source of pressurized fluid; and

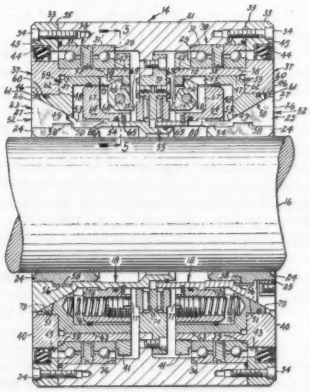
at least one annular seal received in and limitedly axially displaceable in said seal groove and formed with at least one axially throughgoing hole, said seal having an end face turned toward and paired with said one side face, one of the faces of said pair being formed with an annular feed groove, whereby pressurized fluid in said seal groove behind said seal forces same toward said one side face for fluid flow through said respective axial hole and through said respective housing passage into the respective compartment.

3,926,447

COLLET-TYPE WORK HOLDER

Joseph Henry Cox, Jr., Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jan. 14, 1975, Ser. No. 540,910
Int. Cl.² B23B *31/20*
U.S. Cl. 279—57 **3 Claims**



1. A collet chuck having a substantially reduced self-locking tendency when a workpiece slides through the collet, comprising:

a housing;

b. first and second collet carriers, rotatably mounted within said housing;

c. first and second collet sets, slidable within said collet carrier, each comprising an inner member having a locating taper and an outer member having a locating taper cooperating with said inner member;

d. collect biasing means to urge said inner and outer members in a preferred direction for clamping;

e. a thrust flange within said housing and stationary with respect thereto;

f. a reaction ring carried by said inner member and a reaction surface defined in said outer member of said collet sets; and

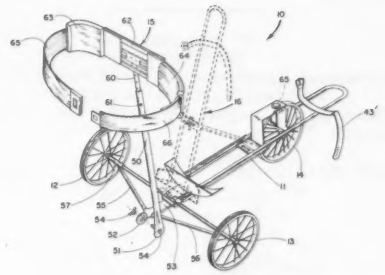
g. a plurality of cams, pivotal on said reaction ring, and engageable with said thrust flange and the reaction surface of said outer member of said collet sets and further wherein movement of said reaction ring carrying said cams causes the reaction of cam forces impressed on said thrust flange to be used to relieve the load of said collet biasing means.

3,926,448

GOLF CART PULLING APPARATUS

Kenneth Reichard, 2601 NW. 23rd Blvd., Apt. 131, Gainesville, Fla. 32605

Filed May 30, 1974, Ser. No. 474,798
Int. Cl.² B62D *51/04*
U.S. Cl. 280—1.5 **5 Claims**



1. A golf cart comprising:

a main frame with a front end and a back end;

at least three wheels rotatably mounted to said main frame, two of said three wheels rotatably mounted to said front end and another of said three wheels pivotally mounted to said back end;

a golf bag holding means movably mounted on said frame being erectable when in use and collapsible when not in use; and,

connecting means secured to said main frame and adapted to be attached to the hips of a human for pulling the golf cart;

said holding means includes an elongated frame having a bottom end pivotally mounted to said main frame adjacent said front end;

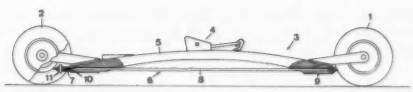
said holding means further includes a support frame with a bottom end pivotally mounted to said main frame, said support frame has an upper end and is pivotable upward toward said elongated frame with said upper end of said support frame lockingly engageable with said elongated frame, said main frame includes a channel with at least two of said wheels mounted thereto, said channel includes a pair of opposed vertical walls joined together with said bottom end of said elongated frame pivotally mounted to said opposed vertical walls.

3,926,449

FOOT ROLLER MEANS

Sven Oscar Eric Wilje, Sturegatan 44, 791 00 Falun, Sweden

Filed Nov. 6, 1974, Ser. No. 521,528
Claims priority, application Sweden, Nov. 7, 1973, 7308937
Int. Cl.² A63C *17/06*
U.S. Cl. 280—11.23 **6 Claims**



1. A resilient foot roller comprising:

a front wheel unit;

a rear wheel unit;

a frame connected to said front wheel unit and said rear wheel unit, said frame having a continuous elastically resilient, downwardly curving, arcuate portion longitudinally extending between said front and rear wheel units

and having two opposite end portions, said arcuate portion for permitting resilience of the foot roller;

clamping means attached to said frame for retaining the foot of a user of said foot roller;

spring means connected to said frame for decreasing the radius of said arcuate portion of said frame; and

adjusting means connected to said spring means for varying the spring force of said spring means.

3,926,450

SKI BINDINGS

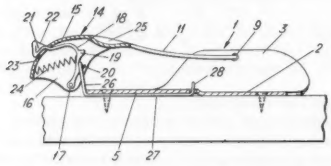
Per Guttulsrud, Havnabakken 12b, Oslo 8, Norway

Filed Jan. 20, 1975, Ser. No. 542,419

Claims priority, application Norway, Oct. 7, 1974, 743612/74

Int. Cl.² A63C *9/18*

U.S. Cl. 280—11.35 B **5 Claims**



1. In a ski binding of the type having a forwardly directed clamping bail pivotally mounted on a toe iron having a foot plate, said foot plate including means for engaging the sole of a ski boot, a locking member comprising a one-armed lever having at least one tooth and pivotally mounted on the forward end of said clamping bail, and a complementary locking member comprising an upwardly directed bail on the forward portion of said foot plate for engaging a tooth on said lever to maintain a ski boot pressed in firm contact with the upper face of said foot plate with said means for engaging in engagement with the sole of the boot, said lever extending upwardly from its pivotal axis on one side of the forward end of said clamping bail and having its free end formed as an actuating lug located on the other side of said clamping bail.

3,926,451

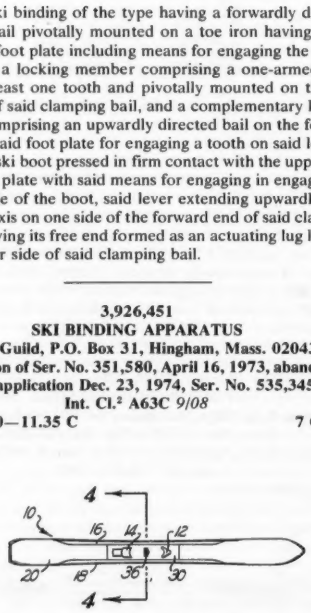
SKI BINDING APPARATUS

William H. Guild, P.O. Box 31, Hingham, Mass. 02043

Continuation of Ser. No. 351,580, April 16, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 535,345

Int. Cl.² A63C *9/08*

U.S. Cl. 280—11.35 C **7 Claims**



1. Ski apparatus comprising a ski composed of a core encased by top, bottom and side walls, each side wall formed of a single element and having a groove, the groove in the two side walls being in alignment with and facing each other, a heel and toe binding mounting plate, the plate slidably received and captured in the grooves, and means to lock the plate in a desired adjusted position.

3,926,452

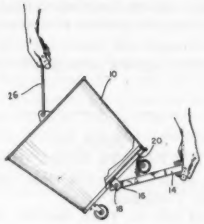
INDUSTRIAL BUCKET IMPROVEMENT

John A. Goines, 412 W. Chestnut St., West Chester, Pa. 19380

Filed Aug. 21, 1974, Ser. No. 499,110

Int. Cl.² B62B *5/06*; **B65D** *25/28*

U.S. Cl. 280—79.2 **6 Claims**



1. A bucket comprising:

a bucket body including side wall structure and a base member;

upper lift means disposed near the top of the bucket for grasping the bucket;

a lever means extended below said base member when said bucket is in an upright position and secured to said base member at a centrally disposed position and extending outwardly of said side wall structure;

means of pivotally securing said lever member to said base member; and

restraining means for urging said lever member toward a position parallel with said base member so that when said bucket is grasped simultaneously by the upper means and by the lever means and tilted, said restraining means will provide controlled restraint as contents of said buckets are emptied, with said upper lift means and said lever means being able to be grasped, lifted and tilted in one motion.

3,926,453

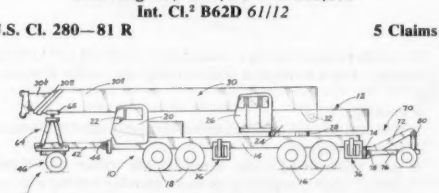
CARRIER VEHICLE WITH PUSHER-TYPE DOLLY

Craig A. Leslie, Milwaukie, Oreg., assignor to Pierce Pacific Mfg. Inc., Portland, Oreg.

Filed Aug. 30, 1974, Ser. No. 502,008

Int. Cl.² B62D *61/12*

U.S. Cl. 280—81 R **5 Claims**



1. In combination with a carrier vehicle including a vehicle frame and wheel support for said frame, said wheel support including dirigible wheels at the forward end for steering the vehicle,

an elongate structure supported by said carrier vehicle extending longitudinally thereof and having the forward end thereof disposed forwardly of the forward end of said carrier vehicle and the dirigible wheels supporting said forward end,

a cradle supporting the underside of the forward end of said structure,

a dolly mounting said cradle disposed forwardly of the vehicle and pushed by the vehicle, said dolly including a dolly frame and swiveled wheel structure supporting the dolly frame and riding on the ground, and

means securing the dolly frame to the vehicle frame accommodating relative vertical displacement of the dolly frame relative to the vehicle frame with the dolly frame maintained as a longitudinally aligned extension of the vehicle frame.

3,926,454

SUSPENSION OF STEERABLE VEHICLE WHEELS, ESPECIALLY FRONT WHEELS OF MOTOR VEHICLES

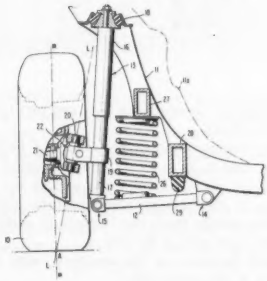
Friedrich H. Van Winsen, Kirchheim, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Oct. 12, 1973, Ser. No. 405,898

Claims priority, application Germany, Oct. 12, 1972, 2249971

Int. Cl.[2] B60G *3/00*

U.S. Cl. 280—124 A **31 Claims**



1. A suspension for steerable vehicle wheels by means of a cross guide means and an essentially vertical support strut means adpated to be telescopically changed in length, said strut means being pivotally connected at its lower end with the cross guide means and being pivotally supported at its upper end at the vehicle superstructure, characterized in that said support strut means includes a lower telescopic part and an upper telescopic part, and the suspension further comprises support arm means for supporting a vehicle wheel, said support arm means being at least essentially rigidly connected with the lower telescopic part above the lower end of the strut means, and pivotal means for pivotally connecting said wheel to said support arm means, said pivotal means being connected to said support arm means entirely inside the wheel cross section at a distance from the axis of the support strut means, and said pivotal means defining a steering axis which passes at least in proximity to the point of contact of the wheel with the road surface and at least through the pivotal support at the upper end of said strut means such that the steering axis extends essentially within the wheel cross-section and said steering axis intersects the axis of the strut means at an acute angle at the pivotal support at the upper end of said strut means, wherein said cross-guide means is pivotally connected to the lower end of said strut means below said pivotal means and outside the wheel cross-section.

3,926,455

SAFETY BELT ARRANGEMENT FOR INDIVIDUALS

Oskar Lennart Lindblad, Hedasgatan 16, 44020 Vargarda, Sweden

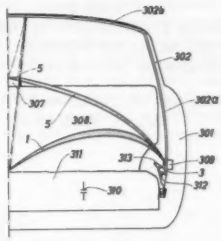
Division of Ser. No. 179,134, Sept. 9, 1971, Pat. No. 3,822,760. This application Apr. 5, 1974, Ser. No. 458,289

Claims priority, application Sweden, Sept. 9, 1970, 12225/70; Sept. 25, 1970, 13045/70; Nov. 2, 1970, 14714/70; Dec. 30, 1970, 17726/70; Feb. 10, 1971, 1694/71

Int. Cl. B60r *21/10*

U.S. Cl. 280—150 SB **5 Claims**

1. A safety belt arrangement for vehicles comprising in combination a vehicle having seats, side walls and a roof, a safety belt, a guide rail extending as well in the vertical direction along one of said side walls of the vehicle as the transverse direction of said vehicle along the roof of said vehicle, a slide connected to said belt and being displaceably mounted on said guide rail, an electric drive motor operatively connected to said slide, an electric circuit for said electric motor, a switch in said circuit capable of sensing the load on one seat of said vehicle, an attachment means which being provided compara-



tively far to the middle of said seat in said transverse direction of said vehicle, and at least one belt part of said safety belt extending between said slide and said attachment means, whereby said belt part is placed across the person sitting on said seat provided with the safety belt arrangement when said attachment slide is displaced from the upper, inner portion of said guide to the outer, lower portion thereof by said drive motor which in turn is activated by said load sensing switch.

3,926,456

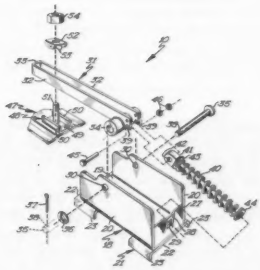
DRAW PIN SAFETY LOCK DEVICE

Kenneth A. Lundebrek, Rte. 1, Benson, Minn. 56215

Filed Feb. 20, 1975, Ser. No. 551,272

Int. Cl.[2] B60D *1/02*

U.S. Cl. 280—515 **4 Claims**



1. A draw pin safety lock device for the vertically disposed draw pin between the drawbar of a towing vehicle and the tongue of a towed implement, the draw pin having an enlarged head at its upper end and extending vertically through openings in the lapped end portions of the drawbar and tongue to define an articulated hitch connection between the towing vehicle and implement, said device comprising:

a mounting member adapted to be rigidly mounted on the drawbar or tongue adjacent the draw pin,

an elongate keeper arm,

means pivotally mounting said keeper arm on said mounting member for pivotal movement about a substantially horizontal transverse axis between a locking position and a release position, said keeper arm having one end portion thereof adapted to overlie and engage the upper surface of the draw pin when the keeper arm is in the locking position,

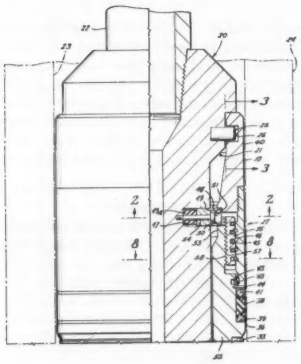
yieldable means interconnected with the keeper arm and said mounting member and yieldably urging the keeper arm into engaging relation with the draw pin when the keeper arm is in the locking position, said keeper arm being pivotal through an overcenter relation against the bias of said yieldable means when shifted to the release position.

3,926,457

WELL COMPLETION APPARATUS

Leonard E. Williams, Jr., and William B. Aiken, both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Apr. 19, 1974, Ser. No. 462,302
Int. Cl.² F16L *35/00*
U.S. Cl. 285—39 **10 Claims**



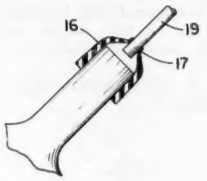
1. A seal assembly for closing off an annular space between the bore of a casing head and a casing hanger supported in the bore, said seal assembly comprising a first tubular member having means adapted to be supported on and connected to the hanger, said first member having first seal means carried thereon for sealably engaging between the first member and the hanger, when said first member is so supported and connected, and an upwardly facing shoulder on its outer side, second seal means supported on the upwardly facing shoulder on the first member, a second tubular member having a downwardly facing shoulder above the second seal means and being movable downwardly with respect to said first member, whereby the shoulders on said members may be moved toward one another to expand said second seal means into engagement between the first member and the bore of the casing head, ratchet means on the first and second member for carrying said first member from said second member and latching said second member in a plurality of vertically spaced positions as it is moved downwardly with respect to said first member, said ratchet means comprising grooves in one and radially expandible and contractible rings on the other of said members, and said grooves being equally vertically spaced apart distance different than the equal vertical spacing between the rings, and means on the second member connectible to a tool for transmitting a downward force thereto for causing it to move downwardly with respect to the first member, when said first member is supported on the hanger.

3,926,458

TUBING ADAPTOR

Gale E. Dryden, 5835 N. Tacoma Ave., Indianapolis, Ind. 46220

Filed Jan. 8, 1974, Ser. No. 431,626
Int. Cl.² F16L *25/00*
U.S. Cl. 285—177 **1 Claim**



1. An adapter for connections between two tubes of different sizes comprising:

a generally circular cup-shaped body of flexible resilient material, said body in its relaxed condtition having a top and bottom, with a large open end at the top, and an aperture in the bottom, said aperture having a flange extending axially from the bottom in a direction away from the open end of the cup;

the material thickness at the aperture being less than the thickness at the open end;

the bottom varying in thickness from a minimum at the aperture to a maximum at the outer circumference of the bottom;

said bottom being generally funnel-shaped, and

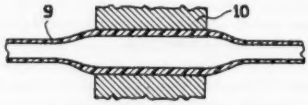
the bottom, including the flange, being invertible upon insertion of a tube therein having an outside diameter greater than the inside diameter of the flange, and returnable to its normal direction of extension upon removal of the tube.

3,926,459

DILATABLE TUBE, METHOD FOR ITS PRODUCTION AND APPLICATIONS THEREOF

Jacques Pontigny, 14, Rue E. Legendre, 95 Margency, France

Filed Dec. 13, 1973, Ser. No. 426,723
Claims priority, application France, Dec. 22, 1972, 72.46071
Int. Cl.² F16L *47/00*
U.S. Cl. 285—381 **9 Claims**

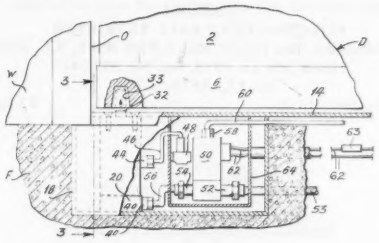


1. Process for the realization of a junction between a thermoplastic tube and an element surrounding a part of this tube comprising irradiating the tube with electrons to yield a tube having elastic memory, heating the tube and stretching it along its entire length so as to reduce its diameter by 50% or more, cooling the tube thus stretched, inserting the tube into said surrounding element following by heating the tube to its memory activation temperature to bring about its expansion and securement with the surrounding element.

3,926,460
LOCKING DEVICE FOR DOORS

Francis C. Peterson, St. Louis County, Mo., assignor to C. Hager & Sons Hinge Manufacturing Company, St. Louis, Mo.

Filed July 15, 1974, Ser. No. 488,655
Int. Cl.² E05B *51/02*
U.S. Cl. 292—144 **7 Claims**



1. In combination with a movable closure structure such as a door and a surrounding structure containing an opening which is blocked by the closure structure when the closure structure is in its closed position, an improved locking device for securing the closure structure in its closed position, said locking device comprising: a fluid cylinder barrel mounted firmly on one of the structures and having a bore; a piston in the bore of the barrel and movable between the ends thereof; a locking element connected to the piston and projected through one end of the barrel, the locking element being movable with the piston between retracted and extended positions, the locking element when in its retracted position being located beyond the other structure so as not to obstruct movement of the closure structure, the locking element when in its extended position being capable of engaging said other structure to prevent movement of the closure structure away from its closed position; return means for urging the piston to the position in which the locking element is in its retracted position; a fluid line connected to a source of pressurized fluid and to the barrel for admitting the pressurized fluid to the end of the barrel so as to cause a force to be applied to the piston in the direction which moves the locking element to its extended position; an electrically operated valve in the fluid line to isolate the bore of the barrel from the source of pressurized fluid so that the return means will move the locking element to its retracted position; a pressure sensitive electrical switch communicating with the bore of the barrel intermediate the ends of the bore, the location being such that the switch is exposed to and actuated by pressurized fluid in the barrel when the locking element is in its extended position but not when it is in its retracted position, the switch controlling a signal to indicate when the locking element is extended; and electrical switch means responsive to the position of the door and connected with the electrically operated valve to prevent operation of the valve except when the closure structure is in its closed position, whereby when the bore is supplied with pressurized fluid through the electrically operated valve, the locking element will engage said other structure and prevent the closure structure from leaving its closed position.

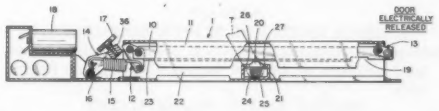
3,926,461
ELECTRICALLY ACTUATED DOOR HOLDER AND RELEASE

Richard E. D'Hooge, Wood Dale, Ill., assignor to Rixson-Firemark, Inc., Franklin Park, Ill.

Filed Aug. 1, 1974, Ser. No. 493,685
Int. Cl.² E05C *17/04*
U.S. Cl. 292—275 **8 Claims**

1. An electrically actuated door holder for the multi-point holding of a pivoted door through a range of opening angles, comprising a holder element, an adjustable linkage of a generally parallelogram configuration including an elongated hold-open bar and a pair of links each individually coupling a different end of the hold-open bar to the holder element, hold-open bar engaging means moved lengthwise relative the hold-open bar in response to variations in door opening angles to thereby engage the hold-open bar at any selected lengthwise point corresponding to the desired angular door opening, and electro-mechanical means including an electromagnet and an armature coupled to the parallelogram linkage and in which the energization of the electromagnet and the resulting armature action moves the hold-open bar into frictional engagement with the hold-open bar engaging means.

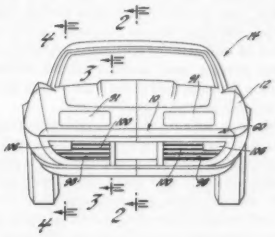
8. An electrically actuated door holder for the multi-point holding of a door throughout a range of door opening angles, comprising a holder frame, an elongated hold-open bar adjustably supported by the frame, an elongated friction engaging means affixed to or an integral part of a surface of the elongated hold-open bar, hold-open bar engaging means movable lengthwise in a linear path relative the hold-open bar in response to variations in door opening angles, adjustable linkage means coupling the hold-open bar to the holder frame to provide a plurality of generally parallel spaced positions between the hold-open bar and the linear path followed by the hold-open bar engaging means, and electromechanical means including an electromagnet and an armature coupled to the hold-open bar and in which energization of the electromagnet and the resulting armature action moves the hold-open bar into a closer generally parallel spacing with respect to the linear path followed by the hold-open bar engaging means, thereby enabling the hold-open bar engaging means to frictionally engage the hold-open bar and further in which the deenergization of the electromagnet releases the armature enabling the hold-open bar engaging means to increase the spacing between the linear path and the hold-open bar by moving the hold-open bar away from the linear path thus effecting release of any door that is held in an open position.



3,926,462
SHOCK ABSORBING BUFFER ASSEMBLY

Ronald N. Burns, Utica, Mich.; Dewayne A. Landwehr, Anderson, Ind.; Roger H. Schroeder, Rochester; Robert A. Vogelei, Lathrup Village, both of Mich., and Gary P. Zeller, Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 11, 1974, Ser. No. 514,079
Int. Cl.² B60R *19/08, 21/14;* **B61F** *19/04;* **B62D** *29/04*
U.S. Cl. 293—63 **3 Claims**



1. An energy absorbing system to provide impact protection for a vehicle comprising a vehicle body, an elongated support

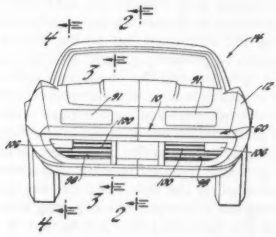
beam extending substantially across the width of said body and secured within the walls of said body, said support beam having a laterally extending channel therein, a plastic one-piece energy absorbing unit coextensive with said beam and seated in said channel and extending longitudinally from said support beam to a position outside of said body, a rigid impact force spreader plate mounted on said energy absorbing unit and in front of a predetermined portion thereof, a flexible plastic facia covering said spreader plate and said energy absorbing unit, means attaching the periphery of said facia directly to a front portion of said body, said energy absorbing unit comprising a grid of longitudinally extending cells which respond to an impact force imparted to said energy absorber system moving said spreader plate by deflecting to absorb the energy of impact, and said grid when deflected up to a predetermined limit possessing a force of recovery to move said spreader plate and said flexible facia to a free state position in response to removal of the impact force.

3,926,463

SHOCK ABSORBING BUFFER ASSEMBLY

DeWayne A. Landwehr, and Gary P. Zeller, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 11, 1974, Ser. No. 514,080
Int. Cl.² B60R *19/08, 21/14;* **B61F** *19/04;* **B62D** *29/04*
U.S. Cl. 293—63 **5 Claims**



1. A resilient one piece energy absorbing grid for a vehicle for absorbing the energy of predetermined impacts of the vehicle comprising a central portion having a plurality of rows of longitudinally-extending cells each rectilinear in cross section and first and second wing portions respectively extending laterally from opposite sides of said central portion, each of said wing portions having a height less than the height of said central portion and having a row of longitudinally-extending cells rectilinear in cross section, a plurality of said cells of said central portion and said wing portions being open at both ends thereof, rear wall means integrally formed at the end of first cell means of said grid being in each of said wing portions, a support for said grid extending laterally of said vehicle and coextensive with said grid, fastener means extending from said support through said rear wall means to secure said grid to said support, second cell means of said grid being in said central portion, said second cell means having integral front wall means, separate plate means mounted on the front of said central portion of said grid for spreading impact loads applied to said central portion, and fastener means projecting from said plate means through said front wall means to secure said plate means to said energy absorbing grid.

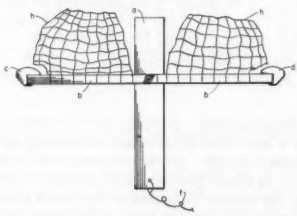
3. In combination with a vehicle, a laterally extending rigid support on said vehicle, a one-piece resilient cellular grid of resilient material mounted on said support for absorbing the energy of vehicle impact, said grid being coextensive with the lateral extent of said rigid support, said grid comprising a plurality of cell means extending longitudinally a predetermined distance from the body of said vehicle, each of said cell means being rectilinear in cross section and having side wall means disposed generally at right angles to each other, a plurality of said cell means being fully open at the front and rear ends thereof, a first number of said plurality of said cell means being substantially identical in cross sectional area and length to form first buckling columns to absorb predetermined impact forces applied thereto, a second number of said plurality of said cell means being substantially larger in cross sectional area than said first number of said cell means to form second buckling columns to absorb impact forces lower than said predetermined impact forces.

3,926,464

FLOATING GOLF BALL RETRIEVER

John Alexander, Box 152-4B, Rte. 1, Kitty Hawk, N.C. 27949

Filed July 23, 1973, Ser. No. 382,041
Int. Cl.² A63B *57/00*
U.S. Cl. 294—19 A **2 Claims**



1. A floating golf ball retriever comprising a keel of buoyant material having attached thereto and extending transversely on respective sides thereof a frame member provided with buoyancy means, each said frame member being disposed to be partially submerged below a water surface in a floating position of said keel and being provided with a bag-like mesh retrieving net having an opening peripherally attached at its edge to the periphery of the respective frame member to extend rearwardly to sweep inn floating golf balls when said keel is moved forwardly through water;

said frame members being pivotally attached to said keel so as to be foldable toward the keel when said retriever is not in use and pivotal outwardly from the keel to a plane generally normal to said keel when said retriever is in use; said frame members having respective outer legs in generally vertical planes to which respective buoyancy means are attached substantially at midsections thereof to permit said nets to dip substantially half their height below a water surface;

and a tow means secured to said keel.

3,926,465

BALL RETRIEVING AND STORAGE DEVICES

Amos N. Hoagland, 1062 N. Vinedo Ave., Pasadena, Calif. 91107, and Jens S. Jensen, 9618 Sante Fe Springs Road, Santa Fe Springs, Calif. 90670

Continuation-in-part of Ser. No. 364,370, May 29, 1973, abandoned. This application Jan. 28, 1974, Ser. No. 437,525
Int. Cl.² A47F *13/06;* **B65F** *3/00*
U.S. Cl. 294—19 A **16 Claims**

1. A tennis ball retrieving and storage device comprising:

a container having an open top and a bottom for holding a substantial number of tennis balls in the container;

a portion of the container bottom including a substantially fixed bottom member extending in a generally horizontal position across the bottom of the container;

support means on opposite sides of the container extending in a substantially upright position above the container bottom;

a vertically movable elongated lifting rod being normally in a substantially horizontal rest position extending across the bottom of the container generally parallel to the fixed bottom member and providing a spacing between it and

the bottom member which is less than the diameter of a tennis ball so as to normally retain the tennis balls in the container; the opposite ends of the lifting rod being supported for guided vertical travel above the container bottom by the opposite support means so the lifting rod travels upwardly into the container away from the container bottom under the pressure of the container bottom being forced down over a tennis ball to provide a sufficient spacing between the lifting rod and the fixed bottom member to allow the ball to enter the container; and

stop means on the container above the bottom thereof for engaging the lifting rod to limit upward vertical travel of the lifting rod to an amount which allows entry of the ball into the container and for instantly allowing the lifting rod to release from engagement with the stop means and travel downwardly to its normal rest position in the bottom of the container for retaining the ball in the container.

3,926,466

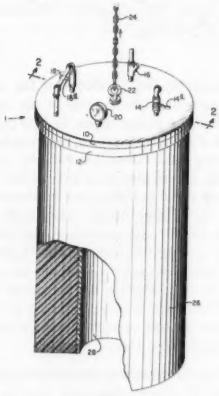
APPARATUS FOR HANDLING ROLLS

Kenneth B. Carpenter, Terre Haute, Ind., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 1, 1973, Ser. No. 402,575

Int. Cl.[2] B66C *1/02*

U.S. Cl. 294—64 R **1 Claim**



1. An apparatus for lifting and transporting a roll of goods having an axial cylindrical opening therethrough, comprising:

a. a rigid plate means having a generally planar top and bottom surface, said bottom surface having attached thereto at least three spaced apart annular seal means defining therebetween at least two annular vacuum chambers, said plate being provided with at least one aperture for applying at least a partial vacuum to said vacuum chamber;

b. a plurality of blocking means attached to said plate means between said annular seal means for restricting movement towards said plate of that portion of said goods between said seals when said at least partial vacuum is applied,

c. a centrally mounted cup means attached to the underside of said plate and adapted to be received in said axial opening in said roll of goods, and

d. a connecting means centrally attached to said plate and extending above said top surface for applying a lifting force thereto.

3,926,467

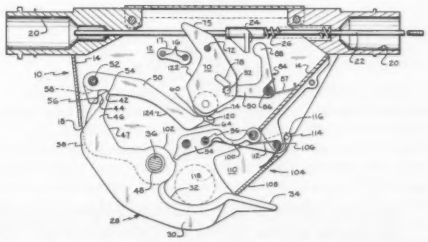
AIRCRAFT CARGO HOOK

Charles F. Crissy, Jackson; Owen W. Sherwin, Spring Arbor, and Christopher L. T. Corbin, Jackson, all of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Mar. 4, 1974, Ser. No. 447,643

Int. Cl.[2] B66C *1/34*

U.S. Cl. 294—83 R **7 Claims**



1. A self resetting cargo hook comprising, in combination, a support, a load arm pivotally mounted on said support pivotal about an axis between a closed load supporting position and an open load releasing position, a first abutment surface defined on said load arm radially spaced from said axis, a latch arm lever pivotally mounted at one end on said support on an axis parallel to said load arm axis and having a free end, a second abutment surface defined on said latch arm adjacent said pivotally mounted end, said latch and load arms having a coincident plane of operative movement, said latch arm being pivotal between a first position whereby said first abutment engages said second abutment preventing pivoting of said load arm from said closed load supporting position to said open load releasing position, and a second position disengaging said first and second abutments permitting said load arm to pivot to said open position, a latch pivotally mounted on said support selectively engageable with said latch arm free end selectively maintaining said latch arm in said first position thereof and releasing said latch arm for movement to said second position thereof, a first reset abutment defined on said load arm, a second reset abutment defined on said latch arm adjacent said pivotally mounted end, said first reset abutment engaging said second reset abutment upon said load arm pivoting from said open position to said closed position to align said first and second abutments and position said latch arm to its said first position, and latch operating means connected to said latch controlling the position of said latch with respect to said latch arm free end.

3,926,468

GRIPPER FOR USE WITH A LIFTING APPARATUS FOR GRIPPING AN ARTICLE DESIRED TO BE LIFTED

Yoshizi Kondo, 2923-11, Togasaki, Misato, Saitama, Japan

Filed Jan. 14, 1975, Ser. No. 540,892

Int. Cl.[2] B66C *1/48*

U.S. Cl. 294—102 R **10 Claims**

1. A gripper for use with a lifting apparatus for gripping an article desired to be lifted comprising:

a pair of support plates arranged in parallel with each other and having at one end along their longitudinal or first

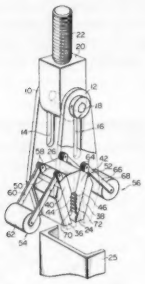
direction a connection means connected to said lifting apparatus, and extending toward the other end;

a trapezoidal column extending in a second direction at right angles to the flat surface of said support plates and integrally connected at both ends, respectively, to said support plates and presenting in cross section an isosceles trapezoid arranged with its bottom surface turned up;

a pair of guide members disposed with said trapezoidal column interposed therebetween and extending in said second direction and integrally connected at both ends, respectively, to said support plates, said guide members having side surfaces opposing, respectively, both inclination side surfaces of said trapezoidal column in parallel and spaced relation thereto and defining with said both inclination side surfaces a pair of elongate void spaces separated from each other at said one end side and united into one space at said other end side, said void spaces and said one space being respectively opened to the exterior;

a pair of clamping members slidably inserted, respectively, into said pair of elongate void spaces and having at their tip end portions, respectively, a pair of grip surfaces which, when allowed to slide toward said other end, approach each other to grip said article; and

a pair of sliding means for moving said pair of clamping members through said void spaces, respectively.

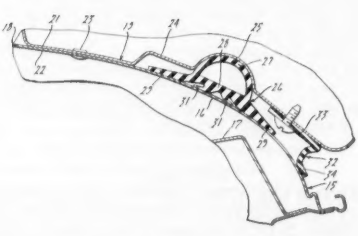


3,926,469

CAB ROOF TO BOTTOM OF COMPARTMENT SEAL

George Ulics, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 13, 1974, Ser. No. 469,581
Int. Cl.² B60P *3/32*
U.S. Cl. 296—23 R **2 Claims**



1. In combination, a motor vehicle cab roof, a forward extension compartment supported above the cab roof, and flexible sealing strip interposed between the cab and the compartment,

the cab roof having an exterior panel with an arcuate marginal portion adjacent the perimeter thereof,

the forward extension compartment having a base wall with a marginal strip overlying in spaced relation the arcuate marginal portion of the cab roof exterior panel,

the base wall marginal strip having a cylindrical recess paralleling the perimeter thereof,

the sealing strip comprising:

a semi-cylindrical body portion having a diametrical base wall,

the curved side of the body portion being complementarily fitted within the marginal strip semi-cylindrical recess and adhesively secured therein,

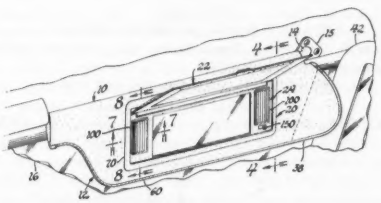
and a plurality of longitudinally extending sealing ribs symmetrically spaced across the diametrical base wall and biased against the arcuate marginal portion of the cab roof exterior panel in sealing relationship thereto, the outermost of the ribs extending laterally of the base wall at an acute angle to the latter in a direction to contact the surface of the arcurate marginal portion of the cab roof exterior panel; interposed between the outermost ribs are a pair of substantially shorter ribs extending at a greater acute angle than the outer ribs to the surface of the exterior panel, each shorter rib when in contact with the exterior panel surface being flexed substantially in the same direction as the proximate outer rib.

3,926,470

VISOR ASSEMBLY

Konrad H. Marcus, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Mar. 21, 1973, Ser. No. 343,198
Int. Cl.² B60J *3/00*
U.S. Cl. 296—97 B **6 Claims**



1. A visor assembly for a vehicle or the like comprising a visor movably joined to the vehicle at the upper end thereof and having a recess, a frame supported by the recess, a vanity mirror supported by the frame, a vanity mirror cover, hinge means supporting said cover for hinging movement on the frame within the recess about an axis at the upper end of the visor between an open position and a closed position relative to said mirror, said hinge means including an offset portion disposed to one side of said axis when said cover is in an open position and at an opposite side of said axis when said cover is in a closed position, and bias means so connected to the offset portion so as to impose on the cover a force acting at one side of said axis for retaining the cover in the open position and a force at the opposite side of said hinge axis to maintain said cover in a closed position.

3,926,471

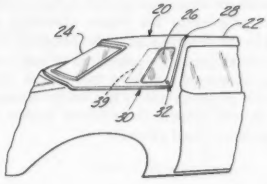
CONSTRUCTION AND PROCESS FOR ORNAMENTAL CAR TOP

Laszlo Nadasi; Marton Nadasi, both of Flushing; John Zelenko, Flint, and Donald E. Pero, Swartz Creek, all of Mich., assignors to City Auto Upholstering Co., Flint, Mich.

Filed May 15, 1974, Ser. No. 470,219
Int. Cl.² B62D *25/06*
U.S. Cl. 296—137 R **5 Claims**

1. An ornamental top for use on a car with a metallic roof, side windows, and a rear window comprising:

a preformed body having an internal contour complementary with the rear portion of the car roof, said top further having side window portions on each side and an open window portion at its rear, said side window portions contain window openings which are of a size substantially less than the windows at the rear portion of the car body and wherein at least one inwardly extending crimping edge is cast in said car top, said edge engageable in tight holding engagement with said windows of said car, and wherein the rear open window portion of said ornamental car top includes a margin portion extending inwardly and



operable to overlap at least a portion of an opposed chrome rim portion on the car body;

a magnetic holding strip mounted on the inner surface of said top protimate its forward margin and engageable with the upper surface of the metallic car body for holding it securely thereon; and

a plurality of fastening means, each insertable through said top and into holding engagement with openings in the body of the car, said fastening means comprise a pair of fasteners, each located at opposite sides of said car top, each of said fasteners extending through the forward lower edge portion of the car top.

3,926,472

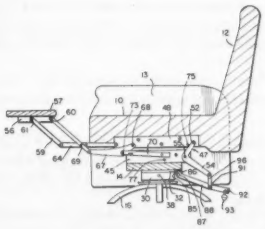
RECLINER CHAIR

Glenn A. Evans, Route 7, Reeds Chapel Road, Morristown, Tenn. 37814

Filed Nov. 9, 1973, Ser. No. 414,270

Int. Cl. A47c *1/02*

U.S. Cl. 297—88 **11 Claims**



1. A recliner chair, comprising a floor-engaging pedestal, a frame mounted on said pedestal, a seat, a backrest fixedly connected to said seat, recliner means interconnecting said seat to said frame, stop means swingably mounted on said frame for movement with respect to said frame about a horizontal axis, a pair of wheels interconnected to said stop means, link means swingably interconnected to said recliner means and stop means, said recliner means permitting said seat and backrest to be moved between a normal upright position and a reclining position and swingably moving said link means to cause said stop means to dispose said wheels into and out of engagement with the floor rearwardly of said pedestal when said seat and backrest are moved into said reclining and upright positions, respectively.

3,926,473

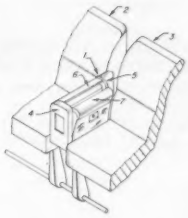
ADJUSTABLE TYPE OF ARMREST UNIT

Gerard T. Hogan, Southington, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 23, 1974, Ser. No. 535,601

Int. Cl.² A47C *13/00*

U.S. Cl. 297—115 **5 Claims**



1. An adjustable armrest means for use between adjacent seating units in a multiple seat arrangement, which comprises in combination, fixed position armrest support framing that is attachable to adjacent seating units and will extend upwardly between them, a movable armrest section including a longitudinal cap portion positioned each side of said support framing, with each such section being hingedly connected to said support framing from its lower portion to thereby permit arcuate movement for the upper cap portion of each armrest section and individual adjustability for the positioning of each armrest cap portion for each seat occupant on each side of the armrest support framing.

3,926,474

VEHICLE SEATS

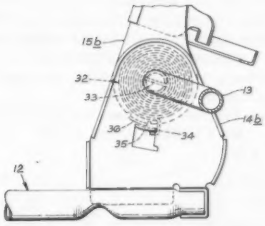
John Paul Johndrow, Stafford, and Joseph Pallant, Albrighton, near Wolverhampton, both of England, assignors to H. R. Turner (Willenhall) Limited, Walsall, England

Filed Aug. 16, 1974, Ser. No. 497,906

Claims priority, application United Kingdom, Aug. 22, 1973, 39721/73

Int. Cl.² A47C *1/025*

U.S. Cl. 297—355 **4 Claims**



1. A reclining seat comprising a seat base part, a back rest part, a pivot member which is fixed to one of said parts and is rotatable relative to the other part, and which connects the two parts together, a mechanism operable to releasably retain the back rest part in selected angular position with respect to the base part, and a coil spring encircling the pivot member for biasing the back rest part forwardly relative to the seat base part, said spring having an inner end which is secured to the pivot member that is fixed to one of said parts, and an outer end which bears against an abutment carried by the

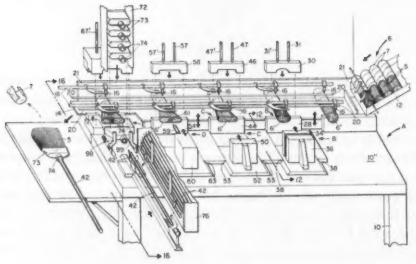
other part, whereby the spring is increasingly stressed as the back rest part is pivoted rearwardly from an upright position relative to the seat base part, characterized in that a further abutment is provided on the part to which the pivot member is fixed, and is located at a distance from the pivot member corresponding to the spacing between the pivot member and said outer end of the spring, in a position to engage said outer end of the spring during pivoting of the back rest part forward from said upright position, to displace said outer end of the spring out of engagement with the first-mentioned abutment, thereby disabling the biasing action of the spring.

3,926,475

MACHINE AND METHOD FOR MANUFACTURING BROOMS FROM PLASTIC FIBERS

Edmund McCaffray, Jr., 2 McKim Ave., Baltimore, Md. 21212

Filed Aug. 28, 1974, Ser. No. 501,331
Int. Cl.² A46D *7/00*
U.S. Cl. 300—21 **10 Claims**



9. A method for automatically producing brooms from elongated plastic fibers, comprising the steps:

a. forming the fibers in cylindrical bundles of a size to make a single broom;

b. melting the end of the bundle of fibers to form a melted mass to support the free ends of the fibers;

c. molding the melted mass into a predetermined rectangular form to provide a shoulder on the bundle of fibers;

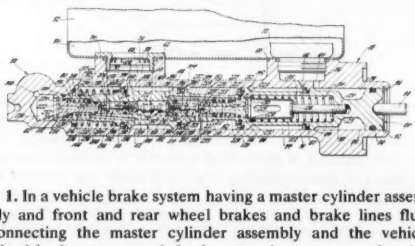
d. allowing the melted mass to partly cool at least on the outer surface and forming a recess extending through the outer surface of the melted mass to a predetermined depth therein.

3,926,476

DUAL MASTER CYLINDER INCLUDING A PLURALITY OF PROPORTIONING VALVES LOCATED WITHIN PRESSURIZING PISTONS

Thomas P. Mathues, Miamisburg, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 10, 1975, Ser. No. 548,355
Int. Cl.² B60T *13/00, 17/18*
U.S. Cl. 303—6 C **3 Claims**



1. In a vehicle brake system having a master cylinder assembly and front and rear wheel brakes and brake lines fluid connecting the master cylinder assembly and the vehicle wheel brakes to transmit brake actuating pressures therebetween, the master cylinder assembly comprising:

a housing having bore means therein and pressurizing piston means sealingly and reciprocably received in said bore means and cooperating therewith to define a plurality of brake fluid pressurizing chambers for pressurizing brake fluid when said master cylinder assembly is actuated to actuate the vehicle front wheel brakes through the brake lines connected therewith and additional pressurizing chambers for pressurizing brake fluid to actuate the vehicle rear wheel brakes through the brake lines connected therewith;

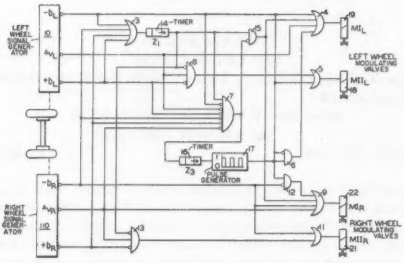
and a plurality of proportioning valve means mounted in said pressurizing piston means and responsive to some brake fluid pressures generated in said brake fluid pressurizing chambers when said master cylinder assembly is actuated to proportion the brake actuating pressures transmitted to the vehicle rear wheel brakes in relation to other brake fluid pressures generated in said brake fluid pressurizing chambers whereby the vehicle rear wheel brakes receive proportionately less brake actuating pressures than do the vehicle front wheel brakes above an effective predetermined pressure.

3,926,477

ANTI-LOCKING VEHICLE BRAKE SYSTEM FOR INDIVIDUAL WHEEL CONTROL

Alfred Klatt, Ronnenberg, Germany, assignor to WABCO Westinghouse GmbH, Hannover, Germany

Filed Feb. 7, 1974, Ser. No. 440,347
Claims priority, application Germany, Apr. 19, 1973, 2319862
Int. Cl.² B60T *8/08*
U.S. Cl. 303—21 P **8 Claims**



1. A fluid pressure actuated anti-skid brake control system for a vehicle having a pair of brake equipped wheels that are independently rotatable on a common axle of the vehicle, said system comprising:

a. signal generator means for providing a plurality of wheel behavior signals according to the dynamic conditions of each respective wheel of said axle;

b. valve means at each wheel for modulating the brake pressure thereat; and

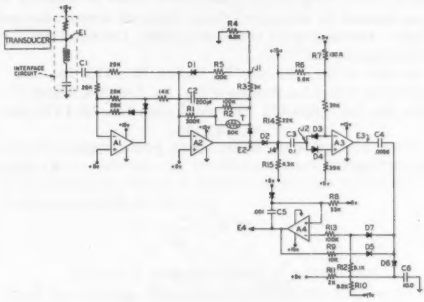
c. evaluation circuit means subject to said wheel behavior signals of the respective wheels for controlling said valve means, said evaluation circuit means being arranged so that when one of said wheel behavior signals of either one of said wheels is shifted in time relative to the corresponding one of said wheel behavior signals of the other of said wheels, the brake pressure of the faster rotating wheel is influenced, by said at least one of said wheel behavior signals of the slower rotating wheel, in such sense as to be held constant.

3,926,478

FREQUENCY QUADRUPLER FOR ANTI-SKID WHEEL SPEED SENSOR

Edgar J. Ruof, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed July 1, 1974, Ser. No. 484,412
Int. Cl.[2] B60T *8/00*; H03K *21/00, 5/00*
U.S. Cl. 303—21 R 6 Claims



1. In an anti-skid system, the improvement of a circuit for increasing the amount of information obtainable from a sinusoidal wheel speed transducer output, comprising

a full wave rectifier connected to the transducer for producing a full wave rectified signal from the sinusoidal output signal of the transducer, the rectifier having a feed back capacitor in shunt with a resistive feed back network to dampen the gain of the rectifier when high frequency signals are received thereby, the resistive feed back network including a thermistor causing the characteristic gain of the rectifier to vary inversely with changes in the ambient temperature;

means connected to the resistive feed back network for reducing the gain of the rectifier when the amplitude of the signals received thereby exceeds a particular level;

an operational amplifier connected to the rectifier and having one input biased with respect to the other, and receiving the rectified signal at the inputs thereof; and

a one-shot circuit connected to the circuit means and receiving the output pulses therefrom and creating pulses of fixed amplitude and duration in response to the output pulses.

4. A circuit for creating a plurality of uniform pulses in time-spaced relationship to a reference sinusoidal signal, comprising:

a full wave precision rectifier receiving said sinusoidal signal and creating a full wave rectified signal therefrom, said precision rectifier including a resistive feed back network providing a characteristic gain for said rectifier and a capacitor in shunt with said resistive feed back network for diminishing the gain of said rectifier at high frequency operation, said resistive feed back network including a thermistor for making the gain of said rectifier temperature variable;

an operational amplifier receiving said rectified signal, one input of the amplifier being biased with respect to another input with both inputs receiving said rectified signal, the operational amplifier producing an output pulse on each transition of said rectified signal through a particular level;

a voltage divider interposed between said rectifier and said operational amplifier to limit the level of the negative going transitions of the full wave rectified signals; and

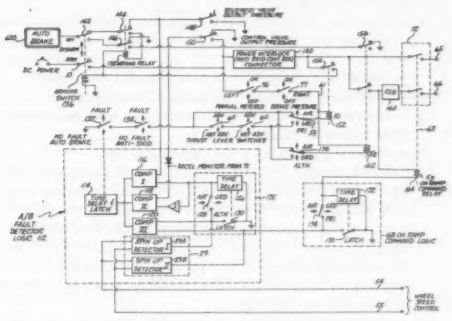
a monostable multivibrator receiving said output pulses from said operational amplifier and responsive thereto to produde output signals of fixed amplitude and pulse width.

3,926,479

AIRCRAFT AUTOMATIC BRAKING SYSTEM HAVING AUTO-BRAKE CONTROL LOGIC

Sherman M. Bissell; Garrett H. De Vlieg, both of Bellevue, and Johan N. Hopland, Renton, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 415,058, Nov. 12, 1973, Pat. No. 3,847,445. This application Oct. 11, 1974, Ser. No. 514,057
Int. Cl.[2] B60T *8/08*
U.S. Cl. 303—21 AF 1 Claim



1. In an automatic brake control system, fault detector circuit means comprising:

first means for developing a signal representative of control valve output pressure;

second means for providing a deceleration monitor signal;

third means for providing an ON-RAMP signal; and

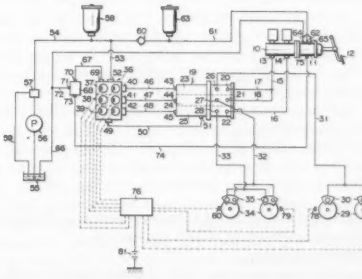
comparator circuit means responsive to said first, second, and third means for indicating a fault condition when said third means for providing an ON-RAMP signal is not ON and both a control valve output pressure signal representative of a control valve output pressure below a predetermined value and a deceleration monitor signal representative of a deceleration level below a predetermined value are present.

3,926,480

ANTI-SKID BRAKE CONTROL SYSTEM FOR VEHICLES

Juichi Shibatani, and Toshiyuki Kondo, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Dec. 23, 1974, Ser. No. 535,370
Claims priority, application Japan, Dec. 21, 1973, 49-875[U]
Int. Cl.[2] B60T *8/08*
U.S. Cl. 303—21 F 10 Claims



1. An anti-skid brake control system for vehicles comprising:

a. a master cylinder for generating a hydraulic brake pressure;
b. wheel brake cylinders;
c. a hydraulic braking circuit connecting said master cylinder to said wheel cylinders, for supplying, during a braking operation, the hydraulic brake pressure from said master cylinder into said wheel cylinder;
d. cut-off valve means disposed in said hydraulic braking circuit and interposed between said master cylinder and said wheel cylinders to control the hydraulic communication therebetween;
e. a hydraulic brake pressure reducing means disposed in said hydraulic braking circuit and interposed between said cut-off valve means and said wheel cylinders and cooperatively connected to said cut-off valve means;
f. a pump-powered hydraulic pressure source;
g. a reservoir hydraulically connected to said pump-powered hydraulic pressure source;
h. means for generating a skid sensing signal;
i. a first hydraulic line for permitting said pump-powered hydraulic pressure source to hydraulically communicate with said hydraulic brake pressure reducing means;
j. a control valve assembly disposed in said first hydraulic line, for controlling the hydraulic communication between said pump-powered hydraulic pressure source and said hydraulic brake pressure reducing means in response to said skid sensing signal;
k. a second hydraulic line for permitting said control valve assembly to hydraulically communicate with said reservoir; and
l. a leak oil flow-preventing valve assembly disposed in said second hydraulic line and hydraulically operated, in accordance with the condition of the braking operation, to open said second hydraulic line so as to render effective the hydraulic communication between said control valve assembly and said reservoir only during the braking operation and to close said second hydraulic line during the non-braking operation;

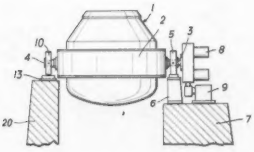
wherein, during the non-braking operation, a leak oil flowing into said second hydraulic line from said control valve assembly is prevented by said leak oil flow-preventing valve assembly from flowing further into said reservoir.

3,926,481

BEARING CONSTRUCTION FOR HEAVY MACHINES, IN PARTICULAR FOR STEEL WORKS CONVERTERS

Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Nov. 27, 1974, Ser. No. 527,535
Claims priority, application Austria, Dec. 7, 1973, 10248/73
Int. Cl.² F16C *17/00, 21/00, 33/02*
U.S. Cl. 308—6 R **12 Claims**



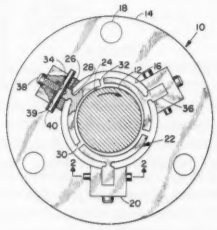
1. A bearing construction for heavy machines, in particular for steel works converters, which comprises
— a bearing housing,
— two trunnions borne in a self-aligning bearing each, one bearing being fixed in relation to a foundation and the other bearing being a movable bearing,
— a lower housing part provided with a cylindrical roll-off surface and carrying out a roll-off movement, with which lower housing part the movable bearing rests on a horizontal foundation plate.

3,926,482

FLUID JOURNAL BEARINGS

Frederick T. Schuller, and Warren A. Moore, both of Cleveland, Ohio, assignors to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Division of Ser. No. 346,483, March 30, 1973, Pat. No. 3,830,552, which is a division of Ser. No. 238,264, March 27, 1972, Pat. No. 3,804,472. This application Feb. 25, 1974, Ser. No. 445,178
Int. Cl.² F16C *7/04, 19/04, 27/00, 1706*
U.S. Cl. 308—9 **4 Claims**



1. In combination with a lightly loaded shaft rotating at high speed having a film of lubricants thereon, and improved bearing comprising
a housing having a bore extending therethrough for receiving said shaft,
a plurality of sectors positioned around said shaft forming lobes for shaping the geometry of said film, each of said sectors comprising
a base portion, and
a pad portion flexibly mounted on said base portion at a neck, said pad portion having a partial cylindrical configuration with a radius greater than that of said shaft thereby forming a first surface facing said shaft and spaced therefrom varying distances so that the film geometry converges and diverges, said pad portion having a trailing edge at the end thereof in the direction of rotation of said shaft and a leading edge at the end in the direction opposite the rotation of said shaft, said neck being located between said trailing edge and said leading edge of said pad portion to form a flexure point therefor, and
means for securing the base portion of each of said sectors to said housing and maintaining the same spaced from adjacent sectors about said shaft.

3,926,483

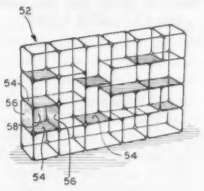
MODULAR FURNITURE STRUCTURE ASSEMBLY

Donald M. Hentrich, 2615 - 35th Ave., Rock Island, Ill. 61201

Filed Oct. 2, 1974, Ser. No. 511,239
Int. Cl.² A47B *3/06, 87/00*
U.S. Cl. 312—107 **1 Claim**

1. A modular furniture structure assembly of generally rectilinear, planar loops of elongated, substantially rigid material, the outer peripheral edge of each leg of each loop being formed of two elongated planar surfaces angularly disposed to the plane of the loop and to each other, so that the line of intersection of said surfaces forms the outer peripheral edge of said leg, said loops being assembled so that at least one of said planar surfaces of each leg of each loop is disposed in

abutting, complimentary relationship to a corresponding planar surface on the leg of an adjacent loop and clamping means for securing said surfaces, so disposed, against lateral displacement relative to each other so that said loops are held in



alignment against load generated forces to form a plurality of rigid, three-dimensional, rectilinear, open frame members interconnected in stacked relation to provide a load bearing structure suitable for shelving.

3,926,484

SPINDLE AND BEARING ASSEMBLIES

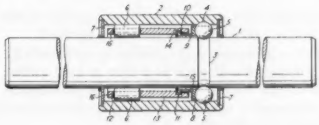
Derek Ray Parkins, Barton-le-Clay, England, assignor to SKF Industrial Trading and Development Company B.V., Jutphaas, Netherlands

Filed Oct. 23, 1973, Ser. No. 408,893

Claims priority, application United Kingdom, Oct. 23, 1972, 48746/72

Int. Cl.² F16C *19/04*

U.S. Cl. 308—174 **10 Claims**



1. A spindle and bearing assembly comprising, a row of balls and a row of rollers which are spaced apart from each other axially along the spindle, said balls and rollers having a common outer bearing ring, the balls being arranged to roll between a first fixed radial groove about said spindle and a second fixed radial groove in said outer bearing ring, said balls and said rollers having a ball cage and a roller cage respectively, each of said cages being interconnected such that said roller cage has no substantial freedom of movement in an axial direction relative to said ball cage, whereby said roller cage and hence said rollers are axially located within the outer bearing ring.

3,926,485

BEARING HOUSING ASSEMBLY

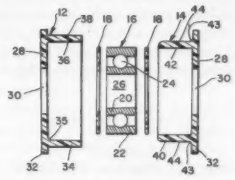
Charles C. Frost, Newaygo, and Siegfried K. Weis, Grand Rapids, both of Mich., assignors to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Division of Ser. No. 355,598, April 30, 1973, Pat. No. 3,844,010. This application Aug. 19, 1974, Ser. No. 498,381

Int. Cl.² F16C *33/00*

U.S. Cl. 308—193 **4 Claims**

1. A bearing housing comprising: a pair of thermoplastic flange members each said member having a flat planar bottom wall portion and an annular outwardly extending side wall portion, said side wall portions having an inner wall surface and an outer wall surface, the inner wall surface on one of said members being slightly larger than the outer wall surface on the other of said members, the inner wall surface of said other of said members being adapted to receive the outer race of a bearing; said other of said members being telescopically received within said one of said members; said one of said mem-



bers being fused to the other of said members to thereby form an integral housing about said bearing.

3,926,486

MODULAR FURNISHINGS

Russell M. Sasnett, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Continuation of Ser. No. 221,190, Jan. 27, 1972, abandoned. This application Jan. 23, 1974, Ser. No. 435,758

Int. Cl.² A47B *53/00*

U.S. Cl. 312—198 **7 Claims**

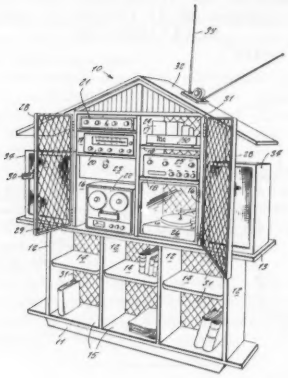
1. A modular furnishing assembly comprising a corner module and at least two additional modules laterally and transversely connected adjacent thereto, respectively, each of said modules being free-standing and having: (1) a base cabinet portion including parallel side walls and a counter top; (2) storage means having a top, a bottom, side walls coplanar with the side walls of said base cabinet, and doors providing access thereto, said storage means being integral with said base cabinet portion through column means and panel structure so that no portion of the kitchen wall behind a module is exposed, said integral column means providing support independently for each module and said storage means further being located above and rearwardly offset from said base portion to define a raceway extending upwardly substantially above the counter top of said base cabinet portion to provide for electrical wiring and plumbing to be installed behind said module, said rearward offset also providing that said doors of said storage means do not swing outwardly beyond the front plane of said module, said module being further characterized by at least one of said column means being spaced inwardly from the common plane of the side walls of the adjacent storage means and base cabinet portion, thereby defining, in conjunction with said counter top of said base portion and said bottom of said storage means, an inset bounded on three sides only and opening on the fourth side for cooperation with a like inset of an adjacent module in abutting association therewith to provide a tunnel for receiving electrical distribution means; connector means for connecting adjacent modules together along abutting side walls thereof, said connector means being acces-

sible from the front of said units; and lighting means located above the top of and attached to said storage means for illuminating the surroundings and providing a molding between said storage means and the ceiling when the module is installed in the room, said lighting means including an upwardly projecting housing portion below the ceiling and adjustable means attached to said housing portion to extend upwardly and abut the ceiling, thereby forming a complete floor-to-ceiling module.

3,926,487
STEREOPHONIC CABINET

Daniel Reyes, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Mar. 18, 1974, Ser. No. 451,899
Int. Cl.[2] A47B *77/08, 81/06*
U.S. Cl. 312—223 **1 Claim**

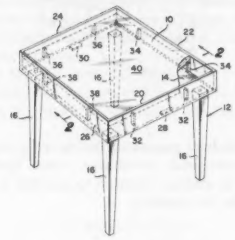


1. A stereophonic cabinet comprising a lower unit having a horizontal base adapted to rest on a support surface, including vertical side walls capped with a horizontal platform extending symmetrically outwardly beyond the side walls, in combination with an upper unit mounted removably on said platform, said lower unit having compartments between the side walls, wherein said upper unit comprises vertical end walls with compartments having various stereophonic components therein, said compartments being symmetric relative to the vertical axis of said cabinet including similar speaker compartments with speakers therein adjacent to each side wall in combination with a sloping roof at the top of the upper unit, said roof having an apex along the vertical center line of the cabinet, said apex being vertically spaced from said compartments providing a chamber therebetween, including a pair of screen doors pivoted on the end walls having inner edges disposed in close adjacency when closed provided with locking means at said edges including an electric burglar alarm housed in said chamber, wherein the speaker compartments are defined by the exterior of the end walls, overhanging portions of said roof, and the portion of the platform which extends beyond the side walls of the lower unit, including an antennae pivotally mounted on each screen door.

3,926,488
STORAGE ATTACHMENT FOR TABLES, WALL PICTURES, AND THE LIKE

Paul E. Amos, 1132 Pennsylvania Ave., McKeesport, Pa. 15122

Filed Nov. 11, 1974, Ser. No. 522,984
Int. Cl.[2] A47B *85/00*
U.S. Cl. 312—241 **12 Claims**



1. A storage attachment for a member having a planar surface of polygonal shape, the attachment including:

a. a polygonal collar comprising a plurality of sides of predetermined height in contiguous relation with the peripheral edges of the planar surface of the member,

b. said collar being constructed of a semiflexible material to permit relative movement of the component parts thereof,

c. internal ribs extending transversely of the sides of said collar and spaced from the longitudinal edges thereof, and

d. supporting tabs engaged with a plurality of the sides of said collar and extending inwardly thereof,

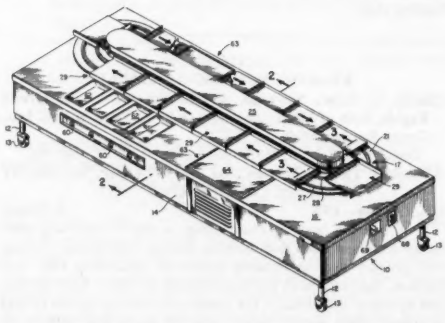
e. each of said supporting tabs being substantially coplanar with a longitudinal edge of a side of said collar, whereby edges of the planar surface may be positioned between said supporting tabs and transverse ribs by flexing one of the sides of said collar,

f. the height of the sides of said collar being greater than that of the planar surface to provide a storage area defined by the planar surface and collar.

3,926,489
APPARATUS FOR USE IN ASSEMBLING FOOD ON TRAYS

Max Gerald Futch, 332 Wilton Drive, Baton Rouge, La. 70815

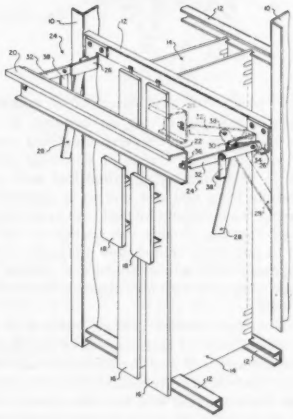
Filed Oct. 4, 1974, Ser. No. 512,001
Int. Cl.[2] B65G *15/00;* **A47B** *91/00*
U.S. Cl. 312—250 **10 Claims**



1. A device for use in making up serving trays with food portions comprising:

a. a cabinet assembly having two spaced apart, longitudinally extending, generally flat top counter surfaces;
b. a hollow, narrow, elongated, serving tray conveyer assembly centrally and longitudinally fixedly positioned between said two top surfaces and extending upwardly a substantial distance therefrom,
i. said tray conveyer assembly having end and sidewalls extending upwardly from said top surface, a continuous shelf projecting outwardly from said end and sidewalls adjacent their upper ends, a plurality of tray support means supported by said shelf for movement thereover, and means located in the upper portion of said tray conveyer assembly for moving said plurality of tray support means around a closed path; and
c. each of said two top surfaces of said cabinet providing means for accommodating a plurality of bulk or individually portioned food containers for placement of individual portions on each of said serving trays by an attendant.

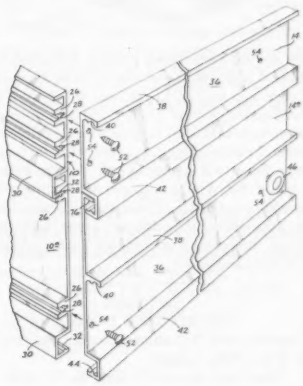
3,926,490
LOCKING BAR FOR PRINTED WIRING CARD FILE
Ansano Bertellotti, Addison, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Apr. 18, 1973, Ser. No. 352,156
Int. Cl.² H05K *5/00*
U.S. Cl. 312—319 **5 Claims**



1. Apparatus for retaining horizontal arrays of printed wiring cards in a printed wiring card file, said apparatus comprising:
a locking bar disposed transversely across said printed wiring card array, said locking bar having disposed on the card engaging surface a layer of resilient material;
retaining means affixed to said printed wiring card file and adapted to engage each end of said locking bar; whereby said locking bar is held under compression against the edges of said printed wiring cards when said retaining means is engaged.

3,926,491
KNOCK-DOWN DRAWER ASSEMBLY
Philip A. Greer, 156 Milliken Creek Drive, Napa, Calif. 94558
Filed Apr. 17, 1974, Ser. No. 461,526
Int. Cl.² A47B *45/00, 88/00, 88/14, 96/06*
U.S. Cl. 312—330 R **3 Claims**

1. A knock-down drawer assembly comprising:
a. a pair of drawer side panels of like and uniform cross section,
b. a pair of drawer end panels of like and uniform cross section extending between and abutting the inner surfaces of the side panels,
c. each of said end panels having on its outer face at least one integral slotted rib extending the length thereof,
d. self-threading screw means extending through openings through said side panels aligned with said slotted ribs and removably connected therewith in the assembled condition of the drawer,
e. drawer bottom mounting means on the lower inner margins of the panels of at least one of said pairs of panels,
f. a drawer bottom mounted removably in said drawer bottom mounting means in the assembled condition of the drawer.
g. an integral track member on the outer face of each drawer side panel, and



h. a pair of track mounting members adapted for attachment to structural supports adjacent the sides of the drawer and including roller means engaging said track member for supporting the drawer for in and out movement relative to the track mounting members.

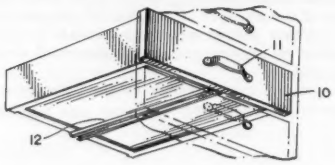
2. The knock-down drawer assembly of claim 1 wherein each side and end panel includes a pair of longitudinal segments adapted to be interconnected edgewise to provide a panel of increased depth, wherein the drawer bottom mounting means comprises inwardly directed channel means integral with the bottom margin of each of said end panel segments, each channel means including an inwardly directed terminal flange, wherein a slotted rib is located adjacent the upper end of each lower end panel segment and wherein the slotted ribs are provided with slots dimensioned for reception of said terminal flanges of the upper segments, thereby enabling assembling the end panel segments into end panels of increased depth by telescoping the terminal flanges of the upper segments into the slots of the lower segments.

3,926,492
DRAWER SLIDE ASSEMBLY
Kenneth H. Gutner, 3285 Dato, Highland Park, Ill. 60035
Filed Sept. 25, 1974, Ser. No. 509,313
Int. Cl.² F16C *29/00*
U.S. Cl. 312—348 **3 Claims**

1. A drawer slide assembly for guiding a drawer during movement in and out of a furniture piece and for indicating when the drawer is almost withdrawn therefrom, comprising: an elongated guide adapted to be mounted in said furniture piece with the length thereof extending generally from the front to the back of said furniture piece, said guide having a portion of its cross section in the form of a T to be partially embraced by a drawer slide, and

an elongated slide adapted to be mounted against the drawer under side in sliding, embracing relation to said guide, said slide having a top wall with side walls depending therefrom and inwardly extending side flanges located a spaced distance below said top wall whereby said embracing relation is achievable,

said guide having a top surface equipped with a step extending transversely thereof and positioned adjacent to but spaced from the front end of said guide,



said slide having a depressed portion in the top wall thereof positioned adjacent to but spaced from the slide front end to engage said step during drawer withdrawal movement, said depressed portion being sized and arranged in conjunction with said step to give a perceptible restraint to the person withdrawing the drawer that further withdrawing movement will disengage the drawer from the furniture piece but which restraint is readily overcome by slight additional pulling force, said depressed portion also being arranged with sufficient cross sectional area to distribute the drawer weight on said guide top surface with limited resistance.

3,926,493

CONNECTING DEVICE

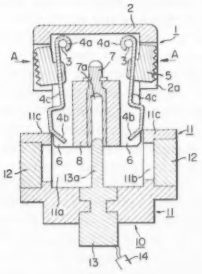
Hiroshi Wakabayashi, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 26, 1974, Ser. No. 527,418

Claims priority, application Japan, Dec. 4, 1973, 48-138313[U]

Int. Cl.² H01R *11/30*

U.S. Cl. 339—12 R **10 Claims**



1. A connecting device using a magnet to accomplish a connection, comprising:

an insert member;

restraining means having a restraining portion and pivotally supported at one end on said insert member;

receptor means;

an engaging portion formed on said receptor means to face said restraining portion of said restraining means upon insertion of said insert member into said receptor means;

a magnetic member provided on one of said means;

a magnet provided on the other of said means and adapted to face said magnetic member upon insertion of said insert member into said receptor means, said magnet being capable of attracting said magnetic member to pivot said restraining means to bring the restraining portion of said restraining means into engagement with the engaging portion of said receptor means and retaining the connection between said insert member and said receptor means; and

a member for pivoting said restraining means to release the engagement between the restraining portion of said restraining means and the engaging portion of said receptor means.

3,926,494

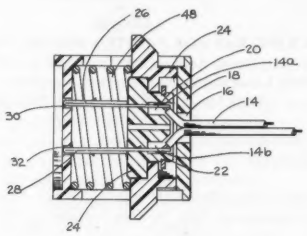
SAFETY ELECTRICAL MALE PLUG HAVING NORMALLY RECESSED MANUALLY EXTENDABLE CONTACTS

Felix Maillaro, Suffern, N.Y., assignor to Michael C. Narducci, Corona, N.Y.

Filed Dec. 12, 1973, Ser. No. 424,167

Int. Cl.² H01R *13/44, 13/62*

U.S. Cl. 339—34 **5 Claims**



1. In a safety plug of the class described, in combination,

a. an insulated housing having an opening in one end thereof, and adapted to receive electrical conductors through said opening; a pair of electrical conductors disposed in said opening; a cylindrical wall extending longitudinally from said one end to an opposite end of said housing; an integrally formed wall extending normal to and substantially closing the portion of the housing adjacent to said opposite end, said integrally formed wall being recessed from said opposite end toward said one end; a pair of spaced openings disposed in said integrally formed wall;

b. a pair of spaced metallic prongs disposed in recessed relation within each of said respective openings in said integrally formed wall and connected to said electrical conductors and electrically insulated one from the other;

c. biasing means urging said metallic prongs within the housing to position the ends of the respective prongs within the pair of openings in the integrally formed wall; and

d. means projecting externally of the housing for moving the recessed metallic prongs from their recessed relation within the integrally formed wall of the housing to an extended relation wherein the metallic prongs extend through the integrally formed wall openings and substantially beyond said opposite end of said housing, said means being manually operable.

3,926,495

ELECTRICAL CONTACT BODY

Angel Nikolaev Pissarev, Sofia; Maria Pancheva Miteva, Plovdiv; Ivan Velev Balabanov, Plovdiv, and Lyubomir Dimov Peychev, Plovdiv, all of Bulgaria, assignors to DSO "ELPROM", Sofia, Bulgaria

Filed Nov. 15, 1974, Ser. No. 524,084

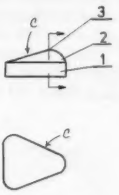
Claims priority, application Bulgaria, Nov. 22, 1973, 25040

Int. Cl.² H01R *3/00, 25/00*

U.S. Cl. 339—48 **3 Claims**

1. An electrical contact body for a contact commutation apparatus, said contact body having a base in the form of a

triangular prism having an isosceles triangular section with rounded-off peaks, a triangular pyramid with rounded-off edges disposed on said base, the uppermost portion of the



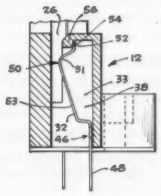
contact body having a spherical surface disposed near the peak formed by the equal legs of the triangular prism base, the remaining walls of the triangular pyramid being tangents to the spherical surface.

3,926,496

CONNECTOR RECEPTACLE

Carl Occhipinti, Melrose Park, Ill., assignor to Bunker Ramo Corporaation, Oak Brook, Ill.

Continuation of Ser. No. 250,710, May 5, 1972, abandoned.
This application Jan. 22, 1974, Ser. No. 435,416
Int. Cl.² H01R *13/62*
U.S. Cl. 339—65 **5 Claims**



1. A receptacle for a flat circuit-bearing element having contact pads adjacent at least one edge thereof comprising:

a one-piece body of insulating material having a slot for receiving the edge of the element having said contact pads, the slot having opposite ends and a pair of vertical uprights integral with the body and positioned adjacent the opposite ends of the slot, one of the uprights including reference means for receiving and locating the element in a predetermined position in the slot and the other upright including resilient means for receiving the element and forcibly positioning it against the reference means, said other upright including side means for laterally directing said element resiliently against said resilient means when said edge of said element is in said slot, said resilient means including a pair of spaced-apart arms and an upper bow joining said arms, one of said arms facing and resiliently restrained from movement towards said reference means, said resilient means including spring means having a lateral ear portion and said other vertical upright including a restraining abutment in juxtaposition with the ear portion for retaining the spring means in the upright.

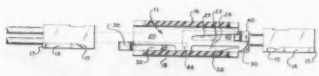
3,926,497

CONNECTOR SHROUD AND ASSEMBLY

George Thomas Eigenbrode, Mechanicsburg, Pa., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Mar. 12, 1974, Ser. No. 451,081
Int. Cl.² H01R *13/54*
U.S. Cl. 339—91 R **15 Claims**

1. A shroud for an electrical connector assembly comprising a unitary housing having a generally rectangular cavity, a pair of opposing side walls of said cavity having recessed openings therein, and an elongated member extending from each side wall longitudinally in each recessed opening, each elongated member having a latch surface on the free end thereof, each latch surface extending from the member toward a side of the recessed opening, and each member being flexible in axial



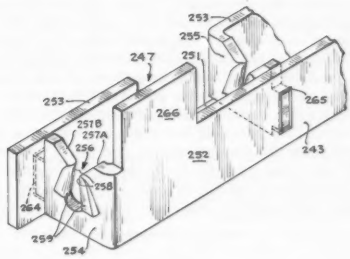
alignment with each recessed opening and toward a side of said recessed opening to receive a flange member on each side of a connector block inserted in the shroud and to engage the latch surface on each elongated member with a mating latch surface on a trailing end of each flange member and releasably secure the connector block in the shroud.

3,926,498

ELECTRICAL CONNECTOR AND INSULATION-PIERCING CONTACT MEMBER

Paul Peter Hoppe, Jr., Arlington Heights, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Sept. 14, 1972, Ser. No. 288,998
Int. Cl.² H01R *9/08, 13/58*
U.S. Cl. 339—97 R **22 Claims**



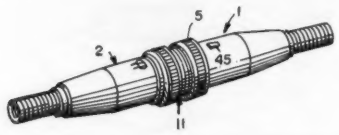
13. An electrical connector unit comprising: insulating means including a plurality of parallel longitudinally extending passages with inner and outer end portions each outer end portion having an upper longitudinal side open for receiving an insulation-covered electrical conductor, and

a plurality of contact members mounted in said passages, including terminal elements disposed in said outer end portions, each of said terminal elements including at least one pair of opposed, transverse flange elements forming an upwardly opening notch for receiving said conductor, said notch including an upper portion having thin edges converging downwardly to afford an insulation cutting section and a lower portion having smooth, curved thickened edges to afford a conductor engaging terminal section, said flange elements being formed of thin, conductive sheet metal and including portions of multiple thicknesses of said sheet metal forming said thickened edges.

3,926,499
ELECTRICAL CONNECTORS WITH INTERCHANGEABLE COMPONENTS

James R. Bailey, Chicago, and Vernon W. Lavigne, Rolling Meadows, both of Ill., assignors to Switchcraft, Inc., Chicago, Ill.

Division of Ser. No. 339,050, March 8, 1973, Pat. No. 3,885,849. This application Dec. 13, 1974, Ser. No. 532,590
Int. Cl.[2] H01R *13/46*
U.S. Cl. 339—136 R 8 Claims



1. An insert for the housing of an electrical connector having a side opening and a tubular front to rear opening to receive said insert, said insert comprising a plurality of either male or female electrical contact components embedded in a self-supporting molded electrical insulating material with terminals connected to said contact components projecting rearwardly from said insert, and latch means comprising a bent resilient strip fixed to a side of said insert and adapted to exert resilient pressure in a plane perpendicular to the longitudinal axis of said insert, said resilient strip being an elongated strip bent at an intermediate section to provide an upwardly extending portion to project into said side opening in said housing and a flat portion to connect to said insert, said insert comprising a channel with undercut sides on the surface thereof sized to receive said flat portion, said channel being open at both ends and extending from the terminal end of said insert toward the electrical contactor end of said insert, an abutment on the surface of said insert spaced from the contactor end of said channel, outwardly extending portions on opposite sides of said flat strip adjacent said bent portion sized to be received by said undercut portions of said sides and a T-shaped configuration on the end of said flat portion sized to fit in said space between said abutment and the inner end of said channel whereby said flat strip can be inserted into said channel from the terminal end of said insert with said outwardly extending portions in the undercut area and said T-shaped end above said channel and moved forwardly until said T-shaped end snaps into said space at the end of said channel.

3,926,500
METHOD OF INCREASING THE DEPTH OF FOCUS AND OR THE RESOLUTION OF LIGHT MICROSCOPES BY ILLUMINATING AND IMAGING THROUGH A DIAPHRAGM WITH PINHOLE APERTURES

Albert Frosch, Herrenberg-Affstaett, and Hans Erdmann Korth, Stuttgart, both of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

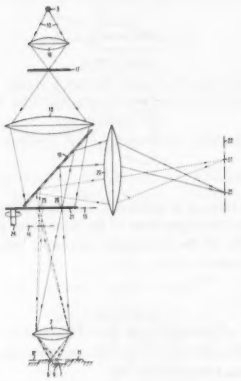
Filed Dec. 2, 1974, Ser. No. 528,965
Int. Cl.[2] G02B *21/06;* G05D *25/00*
U.S. Cl. 350—17 8 Claims

1. Apparatus for producing magnified images of non-flat object surface areas with enhanced depth contrast and resolution of detail comprising:

an objective lens;

means containing plural co-planar pinhole apertures, each pinhole aperture for transmitting a beam of light thru said lens to be incident on an object surface and for re-transmitting a spot-imaged beam of light returned by said lens after scattering reflection of said incident beam from said surface;

means for shifting focal coordinates of each incident beam in three dimensions relative to said surface; and

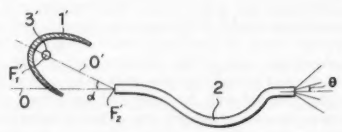


means for utilizing light returned through said apertures to form said magnified images.

3,926,501
DEVICE FOR DIRECTING LIGHT TO ILLUMINATING FIBER OPTICAL SYSTEM

Hiroyuki Hama, Fuchu, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1971, Ser. No. 190,132
Claims priority, application Japan, Oct. 20, 1970, 45-92291
Int. Cl.[2] G02B *5/16*
U.S. Cl. 350—96 B 3 Claims



1. An illuminiating device comprising:

a. a fiber optical system having a light receiving first end face, a light emitting second end face, and an axis perpendicular to said first end face substantially in the center of said first end face;

b. a light source having a spot of greatest brightness; and

c. mirror means for focusing the light of said source on said first end face,

1. said mirror means having a reflecting face in the form of an ellipsoid of revolution about an axis of revolution and having two focal points spaced along said axis of revolution,

2. said focal points substantially coinciding with said spot of greatest brightness and with said first end face respectively, whereby light of said source is emitted from said second end face for illuminating an adjacent area,

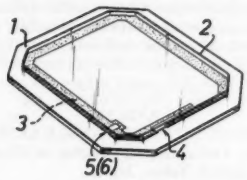
3. said axis of revolution being inclined relative to said axis of said fiber optical system at an angle of inclination of approximately **20°**, whereby the distribution of light over said area is more uniform than at an angle of inclination smaller than **20°** and the light transmitting efficiency of said system is greater than at an angle of inclination greater than **20°**.

3,926,502

LIQUID-CRYSTAL DISPLAY CELL AND METHOD OF MAKING SAME

Eiichiro Tanaka, Kawagoe; Katsuo Nishimura, Tokyo; Hiroshi Shimizu, Kawagoe, and Masao Koshi, Higashikurume, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed July 18, 1973, Ser. No. 380,281
Claims priority, application Japan, July 21, 1972, 47-72468; Jan. 29, 1973, 48-10987; May 8, 1973, 48-50966
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC 5 Claims



1. A liquid-crystal display cell comprising:

a pair of glass substrates disposed parallel to one another and defining between them a space for a liquid crystal substance of the TWIST type;

transparent electrode films on the confronting surfaces of said substrates;

a vapor-deposited heat-resistant orienting layer on each of said electrode films, said orienting layers being deposited obliquely on the respective electrode films with the directions of orienting of said layers lying substantially at right angles to one another;

a low-melting-point glass layer interposed between said substrates and sealing them together along confronting marginal edge portions of the substrates to enclose said substance;

a single opening formed in said cell and communicating between the exterior of said cell and said space for evacuating air from said cell and injecting said substance into said space, said opening being defined by a metalized wall; and

a plug composed in part of a low-melting point metal bonded to said metallized wall and closing said opening.

4. A method of making a liquid-crystal display cell comprising the steps of:

polishing and washing a respective surface of a pair of glass substrates;

vapor-depositing on each of said surfaces a respective transport electrically conductive thin film;

removing part of each of said films to impart a given pattern to the electrode formed by the remainder of the film on the respective substrates;

obliquely vapor-depositing on each of said electrodes respective heat-resistant orienting layers with respective molecule-orienting directions;

disposing said substrates in spaced-apart parallel relation with said surfaces juxtaposed and the molecule-orienting directions of said orienting layers at right angles to one another to define a space;

bonding said substrates together with a low-melting-point glass layer along marginal edges of said surfaces around said space;

forming an opening communicating between the exterior and said space and metallizing the wall defining said opening;

evacuating gas from said space and injecting a TWIST mode liquid crystal substance into said space through said opening under a reduced pressure condition; and

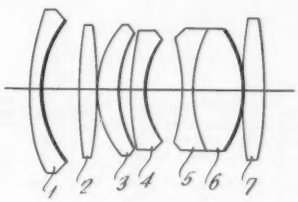
sealing said opening under a reduced pressure condition with a low-melting point metal bonded to the metallized wall.

3,926,503

LARGE APERTURE SEMI-WIDE ANGLE LENS

Yasuo Takahashi, and Michiro Oishi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1974, Ser. No. 497,605
Claims priority, application Japan, Aug. 24, 1973, 48-95502
Int. Cl.² G02B 9/62
U.S. Cl. 350—215 2 Claims



1. A lens system comprising seven successively designated lenses arranged in six groups and possessing the following dimensions and relationships:

r_1	83.826	d_1	4.78	n_1/ν_1	1.55671/58.7
r_2	50.446	d_2	19.85		
r_3	304.333	d_3	7.39	n_2/ν_2	1.79952/42.3
r_4	−203.478	d_4	0.24		
r_5	46.739	d_5	11.00	n_3/ν_3	1.80610/40.8
r_6	74.000	d_6	3.65		
r_7	141.304	d_7	7.11	n_4/ν_4	1.68893/31.1
r_8	43.465	d_8	18.33		
r_9	−64.330	d_9	3.28	n_5/ν_5	1.80518/25.4
r_{10}	93.478	d_{10}	21.74	n_6/ν_6	1.80610/40.8
r_{11}	−62.391	d_{11}	0.22		
r_{12}	239.129	d_{12}	10.87	n_7/ν_7	1.78590/44.2
r_{13}	−214.129				

$F_1 = -239.8$
$F_{1,2,3} = 90.8$
$F_{1,2,3,4} = 458.6$

wherein $F_{1 \ldots i}$ is the composite focal length of the first to the ith lens; ν is the Abbe's number of the ith lens, N_i is the refractive index in the d-line of the ith lens, r_j is the radius of curvature of the jth lens face and d_j is the distance between the jth lens face and the $j+1$ lens face, the lens faces being successively designated from the front to the rear face as the first to the thirteenth, the mating confronting surfaces of the fifth and sixth lenses defining a single face.

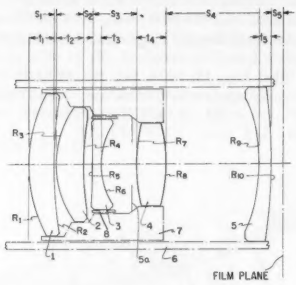
3,926,504

PHOTOGRAPHIC OBJECTIVE

Andor A. Fleischman, Northbrook, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed June 21, 1974, Ser. No. 481,946
Int. Cl.² G02B 3/04, 9/60
U.S. Cl. 350—189 9 Claims

1. A photographic objective for focusing light from an object onto a receiving medium, comprising mounting structure, and first, second, third, fourth, and fifth lens elements being fixedly attached in use to said mounting structure, said third lens element being movably carried by said mounting structure and being movable with respect thereto along said lens axis for focusing light from the object onto the receiving medium, constructed substantially in accordance with the following specifications:



Lens Element	N	V	Radii	Thicknesses	Air Spaces
1	1.69	54.8	$R_1 = +.742F$ $R_2 = -2.192F$	$t_1 = .133F$	$s_1 = .005F$
2	1.691	54.8	$R_3 = +.499F$ $R_4 = -1.195F$	$t_2 = .150F$	
3	1.755	276	$R_5 = -7.374F$ $R_6 = -.379F$	$t_3 = .046F$	$s_2+s_3 = .189F$
4	1.691	54.8	$R_7 = +.922F$ $R_8 = +.868F$	$t_4 = .147F$	$s_4 = .479F$
5	1.492	57.8	$R_9 = -.856F$ $R_{10} = +.2917F$	$t_5 = .058F$	$s_5 = .057F$

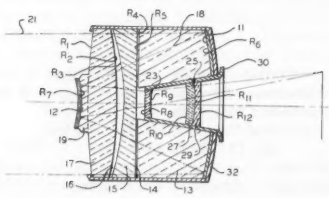
in which the first column lists the lens elements from front to rear, the second column lists the refractive indices respectively for said lens elements, the third column lists the dispersion values respectively for said lens elements, the fourth column lists the radii of curvature R_1–R_{10} of the surfaces of said lens elements numbered front to rear, the + and − values of the radii R denoting surfaces convex and concave to the front, and wherein the value for R_9 is the vertex radius of curvature for an aspheric surface, the fifth column lists the thicknesses t_1–t_5 respectively of said lens elements, the sixth column lists the air spaces s_1–s_5 between said lens elements numbered front to rear, and F is the effective focal length of said photographic objective.

3,926,505

ALL SPHERICAL SOLID CATADIOPTRIC SYSTEMS

Juan L. Rayces, Santa Ana, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed July 22, 1974, Ser. No. 490,524
Int. Cl.² G02B 17/06
U.S. Cl. 350—201 **17 Claims**



1. A compact catadioptric system comprising, in axial alignment:

a. a front solid refractive support element **17** having a generally convex front surface and a convex rear surface and including, on the central portion of its front surface, a concave portion;

b. an intermediate refractive support element **15** separated from said front support element by a first axial air space in the shape of a positive meniscus, said intermediate support element having a front concave surface;

c. a rear solid refractive support element **13** separated from said intermediate support element by a second axial air space, said rear support element having a rear convex surface;

d. a first spherical internal reflecting surface comprising an annular convergent reflecting surface on the rear end of said rear support element; and

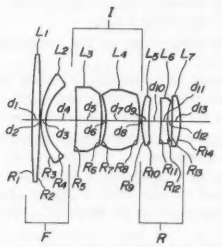
e. a second spherical internal reflecting surface in the form of a circular divergent surface on the concave portion of said front support element to receive light from the convergent reflecting surface and reflect said light through an opening in said annular reflecting surface.

3,926,506

RETROFOCUS TYPE WIDE ANGLE LENS SYSTEM

Haruo Maeda, Fuchu, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Jan. 27, 1975, Ser. No. 544,662
Claims priority, application Japan, Jan. 31, 1974, 49-13327
Int. Cl.² G02B 11/34
U.S. Cl. 350—214 **1 Claim**



1. A retrofocus type wide angle lens system with a front lens group and a rear lens group separated by an intermediate lens group, said front lens group consisting of a biconvex lens followed by a negative meniscus lens turning its convex surfaces toward the object side of the system, said intermediate lens group consisting of a positive meniscus lens turning its concave surfaces toward the object side and followed by a negative meniscus lens turning its concave surfaces toward the object side, and said rear lens group consisting of a positive meniscus lens turning its convex surfaces toward the object side, a biconcave lens and a positive lens, said system conforming substantially to the following conditions:

$f = 100$, F 4.0

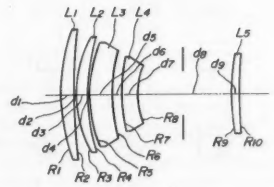
Lens	Radii		Thicknesses and Separations			n		ν
L_1	R_1	865.02	d_1	6.83	n_1	1.67003	ν_1	47.3
	R_2	−1424.08	d_2	1.05				
L_2	R_3	72.62	d_3	3.82	n_2	1.61800	ν_2	63.4
	R_4	35.36	d_4	27.33				
L_3	R_5	−463.53	d_5	22.75	n_3	1.66892	ν_3	45.0
	R_6	−114.16	d_6	2.67				
L_4	R_7	−68.35	d_7	31.42	n_4	1.67790	ν_4	55.3
	R_8	−77.90	d_8	0.88				
L_5	R_9	67.11	d_9	6.78	n_5	1.72600	ν_5	53.6
	R_{10}	238.28	d_{10}	10.35				

	R_{11}	−370.33						
L_6			d_{11}	6.97	n_6	1.75520	ν_6	27.5
	R_{12}	70.66						
			d_{12}	2.75				
	R_{13}	∞						
L_7			d_{13}	7.90	n_7	1.72600	ν_7	53.6
	R_{14}	−64.98						

3,926,507
TELEPHOTO LENS SYSTEM

Jihei Nakagawa, Higashi-Murayama, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Jan. 30, 1975, Ser. No. 545,706
Claims priority, application Japan, Feb. 4, 1974, 49-14217
Int. Cl.² G02B *9/60, 13/02*
U.S. Cl. 350—216 **1 Claim**



1. A telephoto lens system which consists of five single air-spaced lenses which are optically aligned with each other in succession from the object side and convex toward the object side, respectively, the first three lenses being positive meniscus lenses, respectively, the fourth lens being a negative meniscus lens and the fifth lens being a positive meniscus lens which is lengthily air-spaced from said fourth lens, and constructed according to the constructional data given herebelow:

$f = 100$, F:4.5

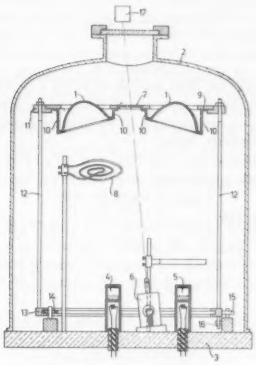
Lens	Radii		Thicknesses and separations		n		ν	
	R_1	39.42						
L_1			d_1	4.72	n_1	1.58913	ν_1	61.1
	R_2	192.88						
			d_2	0.42				
	R_3	31.58						
L_2			d_3	3.36	n_2	1.56873	ν_2	63.1
	R_4	54.73						
			d_4	0.25				
	R_5	36.24						
L_3			d_5	6.39	n_3	1.70154	ν_3	41.1
	R_6	45.79						
			d_6	2.61				
	R_7	91.23						
L_4			d_7	3.89	n_4	1.7847	ν_4	26.2
	R_8	19.10						
			d_8	25.78				
	R_9	63.30						
L_5			d_9	2.55	n_5	1.7847	ν_5	26.2
	R_{10}	174.15						

wherein R_1 to R_{10} inclusive designate the lens curvatures, d_1 to d_9 inclusive designate the refractive index and ν_1 to ν_5 inclusive designate the Abbe number of said lenses numbering from the object side to the image side of said system.

3,926,508
MANUFACTURING A COLD LIGHT MIRROR BY EVAPORATING ZNS AND SIO ALTERNATELY IN AN O_2 ATMOSPHERE

Jan Willem Harmsen, and Augustinus Petrus Jozephus Swinkels, both of Emmasingel, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed Dec. 4, 1972, Ser. No. 311,937
Claims priority, application Netherlands, Dec. 7, 1971, 7116766
Int. Cl.² B29D *11/00;* **B44D** *5/06;* **C03C** *17/00, 17/12*
U.S. Cl. 350—296 **2 Claims**

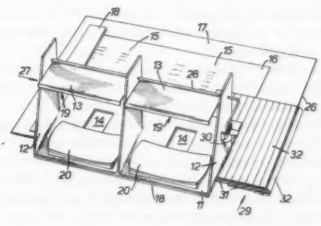


1. A method of manufacturing a concave cold light mirror by coating a curved surface of a transparent support with a plurality of ¼ λ-layers of alternately a material having a relatively high refractive index and a material having a relatively low refractive index by means of vapour deposition in an atmosphere having a pressure such that the vapour jet is dispersed in the space between the vapour source and the surface to be coated, characterized in that a curved surface is alternately provided with layers having a relatively high refractive index and a relatively low refractive index by means of vapour deposition with alternately ZnS and SiO in an oxygen atmosphere at a pressure at which the vapour jets are dispersed between the surface to be coated by vapour deposition and the vapour sources said pressure being about 10^{-3} Torr.

3,926,509
DOUBLE REFLECTION VIEWING INSTRUMENT

George Davies, and Hedda Wertheimer, both of 36½ David Place, St. Helier, Jersey, Guernsey (Channel Is.)

Filed Feb. 5, 1974, Ser. No. 439,728
Claims priority, application United Kingdom, Feb. 9, 1973, 6450/73; May 21, 1973, 24135/73
Int. Cl.² G02B *5/08, 27/24*
U.S. Cl. 350—301 **13 Claims**



1. A viewing instrument comprising:

a base for mounting a sheet upon which material to be viewed is disposed;

a first mirror mounted above said base to reflect light from said sheet;

a second mirror mounted upon said base for reflecting light to the user's eye from said sheet and said first mirror, one of said mirrors being a curved magnifying mirror; and

an adjustable mounting means for said first mirror for enabling said user to continuously manually pivot said first mirror about an axis through the center of curvature of said curved mirror so as to enable said viewing instrument and said user to continuously scan said sheet.

3,926,510

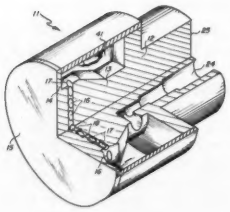
MIRROR FOR HIGH POWER LASERS

Edward V. Locke, Rockport, and Richard A. Hella, Andover, both of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Division of Ser. No. 322,783, Jan. 11, 1973, Pat. No. 3,817,606. This application Mar. 20, 1974, Ser. No. 452,975

Int. Cl.² G02B *5/08*

U.S. Cl. 350—310 **6 Claims**



1. In a mirror for use in a laser, the combination comprising:

a. a thick integral metal block member having a hardness greater than about Rockwell B 30 , a rear surface and an exposed surface, said exposed surface being adapted to define a laser mirror surface, and block member having a plurality of co-planar intersecting passages, said passages in combination with said exposed surface defining a face portion, said passages in combination with said rear surface defining a rear portion, and a plurality of spaced connector members extending between and integral with said face and rear portions defined by said passages;

b. metal wall member means sealably attached to said block to define coolant manifold means in communication with the ends of each passage; and

c. baffle means between said wall member means and said block member separating said manifold means into an inlet coolant manifold and an outlet coolant manifold whereby coolant introduced in said inlet coolant manifold flows substantially only through said passages and into said outlet coolant manifold, said block member having a coolant inlet passage in communication with said inlet coolant manifold and a coolant outlet passage in communication with said coolant outlet manifold.

3,926,511

METHOD AND DEVICE FOR SYNCHRONIZING THE DISPLACEMENTS OF TWO MOVING BODIES

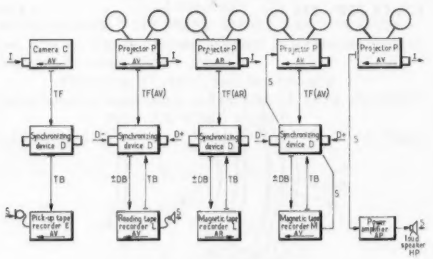
Andre Jean-Claude Gendrot, 102 rue Anatole France, 93 - Drancy, and Jean Lucien Yves Chartrin, 2, Quai Villebois-Mareuil, 41 - Bloise, both of France

Continuation of Ser. No. 208,350, Dec. 15, 1971, abandoned. This application Jan. 2, 1974, Ser. No. 429,757

Claims priority, application France, Dec. 16, 1970, 70.45422

Int. Cl.² G03B *31/04*

U.S. Cl. 352—5 **14 Claims**



1. A method for recording and reproducing in synchronism pictures and sounds of a filmed scene, said method comprising a first step which consists in simultaneously recording the pictures and sounds, respectively, on a photographic film and on a magnetic tape, each being driven independently of the other by independent drive means, while generating recurrent pulses, in synchronism with the driving of said film, and recording said pulses on a separate track of said magnetic tape, and thereafter developing said film, said tape being provided with a blank sound track

- a second step which consists in projecting the scenes of the developed film and playing back said tape for simultaneously reproducing the pictures and the sound characteristic of said scene in proximate time correspondence, generating control pulses in synchronism with said film drive while reading said recurrent pulses recorded on said tape, counting said control pulses and recorded recurrent pulses and automatically controlling one of the drive means for adjusting the respective counts of said control pulses and recorded pulses so as to be substantially equal whereby to improve the picture synchronization with sound, ideal synchronization of the picture and sound being achieved by selectively and momentarily manually discontinuing either of said counts,

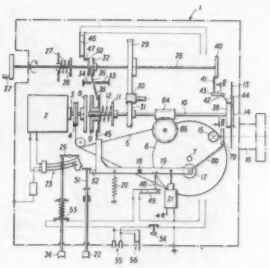
a third step which consists in reversely driving said film and tape to the beginning of said scene while preserving said ideal synchronization by counting said control pulses and recorded pulses and automatically controlling one of said drive means as in said second step,

and a fourth step which consists in again driving said film and tape in the normal forward direction for simultaneously reproducing said pictures and said sound from the beginning to the end of said scene while preserving said ideal synchronization as in said third step, and transferring the sound recorded on the tape in the first step to the blank sound track on the tape.

3,926,512
SOUND PROJECTOR

Otto Freudenschuss, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Jan. 25, 1974, Ser. No. 436,597
Claims priority, application Austria, Feb. 19, 1973, 1425/73
Int. Cl.[2] G03B *31/00*
U.S. Cl. 352—25 **17 Claims**

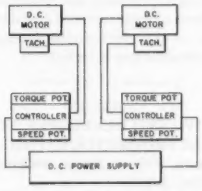


1. A sound-film projector comprising: a motor provided with a shaft; a flywheel driven by the motor; a sound spindle rotatated by the flywheel; a pinch roller defining with the spindle nip for driving a sound strip; a deactivating device operable to prevent the rotation of the flywheel-driven spindle from entraining the sound strip between the roller and the spindle; a film-projection window; an intermittently operating traction element normally connected with said shaft for imparting indexing motion to a film aligned with the window; a decoupling member operable to disconnect said shaft from said traction element; and quick-start means controlling said deactivating device and said decoupling member in their operated positions and operable, while the flywheel is being driven at a normal speed by the motor, to restore the nip drive to the strip while simultaneously reconnecting the traction element with said shaft.

3,926,513
BIDIRECTIONAL WEB MEDIUM DRIVE

Edward S. Silver, Hackensack, and Robert E. Tucker, Passaic, both of N.J., assignors to Computer Specialties Corporation, Hackensack, N.J.

Filed May 9, 1974, Ser. No. 468,353
Int. Cl.[2] G03B *23/12*; **H02P** *7/68*, *7/00*
U.S. Cl. 353—26 **9 Claims**



1. A bidirectional web medium drive for moving a web of material between two reels comprising:

first and second reversible motors;

drive means each having an input coupled to the output of each of said motors, and an output which is restricted from rotation unless the input is driven;

first and second spindles each connected to each output of said irreversible drive means, said spindles adapted to receive and support the reels;

a torque controller coupled to one of said motors for maintaining an output torque to that motor;

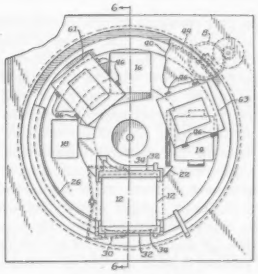
a variable speed controller coupled to the other of said motors for controlling the output speed of that motor; and

switch means coupled to said torque and speed controllers for running said first and second motors in the same direction, said switch means having at least two positions so that when said switch means is in a first position, the torque controller is connected to said first motor to apply a torque to said first spindle causing its associated reel to be the web take-up reel, and the speed controller is connected to said second motor to apply a selected speed to the second spindle causing its associated reel to be the web supply reel, and when said switch means is in a second position, said torque controller is connected to said second motor and said speed controller is connected to said first motor and the direction of rotation of said motors is reversed so that the reel on said first spindle becomes the supply reel and the reel on said second spindle becomes the take-up reel.

3,926,514
SLIDE PROJECTOR LOADING-UNLOADING STATION

Carl C. Costanza, Chicago; Walter W. Weber, Des Plaines; Frank W. Betlejewski, Chicago, and Richard Frystak, Park Ridge, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 860,384, Sept. 23, 1969, Pat. No. 3,659,934. This application July 6, 1971, Ser. No. 160,069
Int. Cl. G03I *23/02*
U.S. Cl. 353—113 **1 Claim**



1. In a slide projector the combination comprising:

means for supporting a magazine containing a horizontally oriented stack of slides to be projected;

a collection chamber, having an open end underlying said support means, for collecting said stack of slides after projection in said projector;

pivoted retaining means disposed between said magazine and said open end of said collection chamber;

elastic means for urging said retaining means into a position such that the lowermost slide in said stack is supported by said retaining means during projection of said stack and the slides in said stack are prevented from passing directly from said magazine to said collection chamber;

means for transporting the slides in said stack to a projection station and then to said collection chamber; and

means within said collection chamber for returning the projected slides to said magazine by moving said retaining means in opposition to said elastic means to permit the passage of said projected slides.

3,926,515
PHOTORECEPTOR CHANGING APPARATUS FOR ELECTROPHOTOGRAPHIC COPYING MACHINES

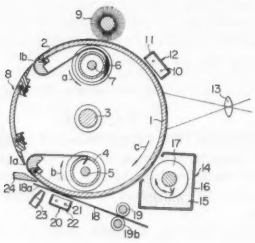
Yasumori Nagahara, Yokosuka, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed July 19, 1973, Ser. No. 380,550

Claims priority, application Japan, July 31, 1972, 47-76718; July 31, 1972, 47-76719; Aug. 3, 1972, 47-78131; Aug. 3, 1972, 47-78132

Int. Cl.² G03G 5/10

U.S. Cl. 355—3 R 14 Claims



1. A photoreceptor changing apparatus comprising a supply reel rotatably mounted in the interior of a cylindrical supporter and having mounted thereon in roll form a photoconductive strip made of a pliable material and adapted to be paid out and applied to the outer periphery of said cylindrical supporter to serve as a photoreceptor on which an image of an original to be duplicated is formed for transfer printing on copy sheets, a take-up reel rotatably mounted in the interior of said cylindrical supporter and adapted to have said photoconductive strip wound thereon, and a photoconductive strip advance device disposed outside said cylindrical supporter and operated by a drive for rotating the cylindrical supporter to rotate said take-up reel and advance the photoconductive strip so that a portion thereof serving as a photoreceptor on the outer periphery of the photosensitive drum can be replaced by the next following portion thereof to thereby change the photoreceptors, wherein said photoconductive strip advance device comprises a drive gear for rotating said take-up reel secured to a drive shaft for said photosensitive drum, a transmission gear in meshing engagement with said drive gear, a connection gear coaxially mounted with said transmission gear, clutch means interposed between said transmission gear and said connection gear, a sun gear mounted on said drive shaft and maintained in meshing engagement with said connection gear, and a photoconductive strip advance gear secured to said take-up reel and maintained in meshing engagement with said sun gear, said strip advance gear normally revolving around said sun gear as said photosensitive drum is rotated, rotation of said transmission gear being transmitted through said connection gear to said sun gear when said clutch is engaged to produce a difference in the number of revolutions between said sun gear and said photosensitive drum, so that said strip advance gear is made to revolve on its own axis by said differential rotation to thereby advance the photoconductive strip and wind on the take-up reel the portion of the photoconductive strip on the outer periphery of the photosensitive drum.

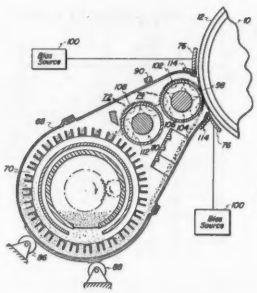
3,926,516
DEVELOPMENT APPARATUS FOR AN ELECTROSTATOGRAPHIC PRINTING MACHINE

Charles A. Whited, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 20, 1974, Ser. No. 444,089

Int. Cl.² G03G 15/09

U.S. Cl. 355—3 DD 3 Claims



1. An electrophotographic printing machine of the type having a photoconductive member, means for charging the photoconductive member to a substantially uniform charge potential, and an exposure mechanism for projecting a light image corresponding to the original document being reproduced onto the charged photoconductive member to record thereon an electrostatic latent image thereof, wherein the improvement includes:

a developer housing defining an open ended chamber for storing charged particles;

magnetic field producing means mounted internally of said developer housing and positioned closely adjacent to the photoconductive member, said magnetic field producing means forming a brush-like array of charged particles extending outwardly from the open end of the chamber of said developer housing in brushing contact with the electrostatic latent image recorded on the photoconductive member;

at least one conductive plate having one end portion secured to said developer housing, said plate extending in an outwardly direction from the region of the brush-like array of charged particles extending from the open end of the chamber of said developer housing and being closely spaced from and substantially parallel to the photoconductive member; and

means for electrically biasing said conductive plate to suppress the effects of local contrast enhancement during the development of the electrostatic latent image recorded on the photoconductive member.

3,926,517
RESIDUAL POWERED DEVELOPER HOMOGENIZER FOR ELECTROPHOTOGRAPHIC DEVICE

Yasumori Nagahara, Tokyo, Japan, assignor to Ricoh Company Ltd., Tokyo, Japan

Filed July 22, 1974, Ser. No. 490,814

Claims priority, application Japan, Oct. 26, 1973, 48-124195

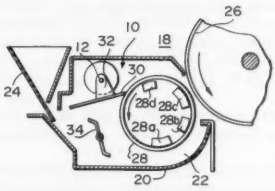
Int. Cl.² G03G 15/00, 21/00

U.S. Cl. 355—3 DD 8 Claims

1. In an electrophotographic device having a photoconductive member adapted to produce an electrostatic image of a document, an applicator for applying powdered developer to the photoconductive member to develop the image and a cleaner for removing residual developer from the applicator, the cleaner having an inclined flat surface down which resid-

ual developer moves after being removed from the applicator, wherein the improvement comprises a homogenizer to homogenize the residual developer as the same moves down the flat surface, said homogenizer comprising:

a shaft rotatably mounted above and in a plane parallel to the flat surface the axis of said shaft being substantially transverse to the direction of movement of the residual developer; and



a plurality of substantially elliptical plates mounted for rotation with said shaft, the minor axes of said plates perpendicularly intersecting the axis of said shaft and the major axes of said plates intersecting the axis of said shaft at an acute angle, the edges of said plates being closely adjacent to the flat surface at all rotational positions of said shaft; whereby

residual developer moving down the flat surface is deflected by said plates and thereby homogenized.

3,926,518

OPTICAL SCANNING SYSTEM

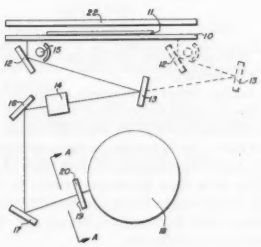
Peter J. Berry, Glasgow, Scotland, and Gerald J. Maguire, Stevenage, England, assignors to Xerox Corporation, Stamford, Conn.

Filed May 21, 1974, Ser. No. 472,023

Claims priority, application United Kingdom, May 23, 1973, 24563/73

Int. Cl.² G03G *15/28*

U.S. Cl. 355—8 **1 Claim**



1. An optical scanning system for scanning a document to be copied providing an optical path and including document illuminating means, light intensity detector means having a line of sight adjacent to said optical path, and control means arranged to respond to signals from said light intensity detector means to adjust the intensity of illumination passing along said optical path,

a xerographic photoreceptor having an electrical bias voltage impressed thereon, and

means to vary said bias voltage on said photoreceptor in response to said control means.

3,926,519

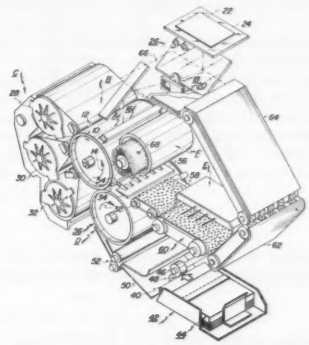
CONTROL DEVICE FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

Robert P. Rebres, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 3, 1974, Ser. No. 475,689

Int. Cl.² G03G *15/00*

U.S. Cl. 355—14 **9 Claims**



1. An electrophotographic printing machine of the type having a fusing apparatus to substantially permanently affix a powder image to a sheet of support material, including:

means for separating and advancing successive sheets of support material from a stack thereof;

means for supporting a first stack of sheet material in said separating and advancing means;

removable means for supporting a second stack of sheet material in said separating and advancing means; and

means, responsive to insertion of said second stack supporting means in said separating and advancing means, for automatically switching the fuser temperature set-point from a first temperature for the first stack of sheet material to a second temperature for the second stack of sheet material.

3,926,520

SYSTEM FOR ELECTRONIC ADJUSTMENT OF EFFECTIVE CONTRAST RATIO IN PHOTOGRAPHIC REPRODUCTION

Irving Kaufman, Tempe, Ariz., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 12, 1974, Ser. No. 488,084

Int. Cl.² G03B *27/76*

U.S. Cl. 355—80 **9 Claims**

1. A system for controlling contrast of light passing through a transparency to a photosensitive surface comprising:

a. a source of polarized light directed to the transparency;

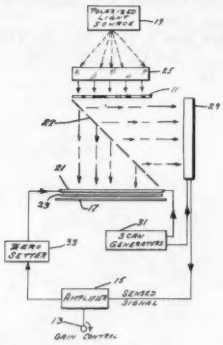
b. a plate of transparent ferroelectric material segmented into a multiplicity of elements positioned to receive the light emitted through the transparency;

c. a polarizer interposed between the transparent ferroelectric material and the photosensitive surface said polarizer being adapted to intercept the light passing through the transparent ferroelectric material;

d. a plane surface partially reflective and partially transparent positioned between the transparency and the ferroelectric material;

e. an array of photosensors aligned to intercept the reflective light from the plane surface, the electrical output of the array being fed to the elements of the ferroelectric material; and

f. a scan generator connected between the photosensitive array and the ferroelectric material for simultaneously



scanning the output of the photosensors and the corresponding elements of the plate of ferroelectric material.

3,926,521

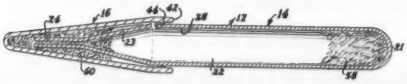
BLOOD COLLECTING AND PROCESSING MEANS

Byron E. Ginzel, R.R. 1, Lucerne, Ind. 46950

Filed Feb. 21, 1973, Ser. No. 334,488

Int. Cl. G01n *33/16*

U.S. Cl. 356—39 **8 Claims**



1. Blood collecting and processing means comprising:

a container member having a storage chamber and an open ended capillary tube; the bore of said storage chamber being of substantially greater size than the bore of said capillary tube;

said container means including a tapered hollow neck portion extending outwardly of said storage chamber and connecting said capillary tube to said storage chamber;

said container member being closed at the end thereof remote from said capillary tube;

means on said container member for providing easy separation of said capillary tube and neck portion from said storage chamber;

opening means in the side wall of said container member for forming a vent;

said opening means being located in said container member at a point farther remote from said closed end than is said separation means.

3,926,522

FAR-INFRARED RADIANT INTENSITY METER

John R. Andreotti, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 27, 1973, Ser. No. 419,316

Int. Cl.[2] G01N *21/34*

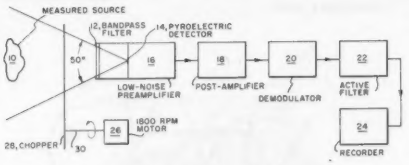
U.S. Cl. 356—51 **2 Claims**

1. A radiometer for measuring the entire infrared radiation response of a black body source for a narrow band of infrared frequencies at short range comprising:

means for modulating said infrared radiation;

optical filter means mounted in an aperture of a sensing device for passing said infrared radiation through said aperture having a frequency response falling in a narrow band of frequencies in the infrared spectrum;

pyroelectric detection means mounted in said sensing means behind said aperture for sensing said infrared radiation over a conical field of view having an apex angle of not less than 50° to produce an electrical signal representative of a uniform response of said pyroelectric detection means over said conical field of view;



means for variably amplifying said electrical signal;

nonlinear feedback means for demodulating said electrical signal;

active electronic means for filtering said electrical signal;

means for recording said electrical signal to detect its magnitude which is indicative of the intensity of said infrared radiation.

3,926,523

OPTICAL SYSTEM FOR ANGLE MEASUREMENT BY INTERFEROMETRY

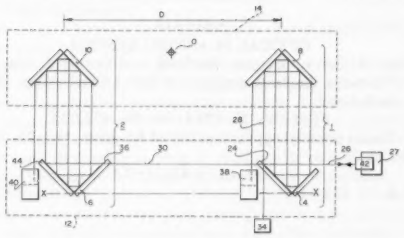
George D. Chapman, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Aug. 26, 1974, Ser. No. 500,364

Claims priority, application Canada, July 22, 1974, 205272

Int. Cl.[2] G01B *9/02*

U.S. Cl. 356—110 **4 Claims**



1. An optical system for angle measurement by interferometry comprising:

a. two, similar beam pathlength multipliers each consisting of a fixed retroreflector and a movable retroreflector in the reflecting path of the corresponding fixed retroreflector to form the beam pathlength multiplier therewith,

b. fixed mounting means mounting both of the fixed retroreflectors with their inversion planes in a common plane which is normal to beams to be reflected back and forth between each fixed retroreflector and the corresponding movable retroreflector,

c. rotatable mounting means mounting both of the movable retroreflectors for rotation together about a single axis at right angles the said beams, and with the movable retroreflectors at a predetermined distance apart,

d. a beam splitter adjacent a first one of the fixed, retroreflectors, for splitting a primary beam of electromagnetic energy, from a source thereof, into two secondary beams, and directing one secondary beam into the reflecting path of the beam pathlength multiplier containing the said first fixed retroreflector, and the other secondary beam in front of the reflecting faces of a second one of the fixed retroreflectors,

e. a beam folder adjacent the said second, fixed retroreflectors for reflecting the said other secondary beam to beam

pathlength multiplier consisting of the said second, fixed retroreflector and the corresponding movable, retroreflector thereto,

f. two retroreflectors each adjacent one of the fixed retroreflectors, and each for reflecting one of the said secondary beams back along paths between the adjacent, fixed retroreflector and the corresponding movable retroreflector towards the beamsplitter where interference between the secondary beams will occur, forming patterns of fringes, whereby,

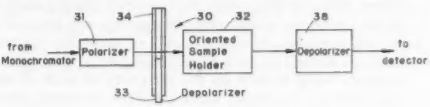
g. when a primary beam of electromagnetic energy is directed from a source thereof to the beam splitter, angular displacements of the rotatable mounting means about said axis of rotation can be deduced from the pre-determined distance that the ridges of the movable retroreflectors are apart and a count of the number of fringes generated at the beam splitter by rotation of the rotatable mounting means.

3,926,524

METHOD OF AND MEANS FOR OBTAINING A PAIR OF ORTHOGONAL LINEAR DICHROIC PARAMETERS

Leon Margulies, Rehovot; Yehuda Mazur, Tel Aviv; Jacob Sagiv, and Amnon Yogev, both of Rehovot, all of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed Apr. 8, 1974, Ser. No. 459,167
Claims priority, application Israel, May 3, 1973, 42186
Int. Cl.² G01N *21/40*
U.S. Cl. 356—114 **13 Claims**



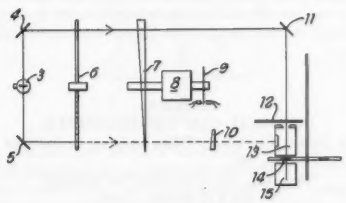
11. An optical system according to claim **10** including a light source, and a variable wavelength monochromator for converting light from the source to a beam whose wavelength changes periodically with time, means mounting the source and the monochromator so that said beam passes through the linear polarizer, and a detector for detecting the intensity of light passed by said one de-polarizer.

3,926,525

PHOTOMETRIC APPARATUS INCLUDING A ROTATABLE OPTICAL DENSITY WEDGE

George Edward Sheldrick, Ilford, England, assignor to Ilford Limited, Essex, England

Filed May 8, 1974, Ser. No. 468,157
Claims priority, application United Kingdom, May 16, 1973, 23401/73
Int. Cl.² G01J *1/40*; G01N *21/22*
U.S. Cl. 356—205 **3 Claims**



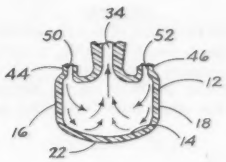
1. A photometric apparatus comprising:
a light source;
means for producing from the light emitted by said light source a measuring beam of light and a reference beam of light, said beams of light following different paths;
a common light modulation system for both said beams positioned in the paths thereof;
a photodetector and means for directing said beams of light on to said photodetector, said photodetector comprising means for determining and comparing the intensity of said measuring beam and said reference beam;
said light modulating system comprising an optical density wedge having parallel isopaques which are contours of constant density; and
said density wedge being rotatable about an axis perpendicular to the plane of said wedge and which is so located in the photometric apparatus that rotation of said wedge in a first direction increases the optical transmission of said reference beam and decreases the optical transmission of said measuring beam, and rotation of said wedge in a second direction decreases the optical transmission of said reference beam and increases the optical transmission in said measuring beam.

3,926,526

FLOW CELL

Gunther Weiss, 2025 SW. Briggs Court, Beaverton, Oreg. 97005

Filed May 28, 1974, Ser. No. 473,359
Int. Cl.² G01N *1/10*
U.S. Cl. 356—246 **5 Claims**



1. A flow cell for containing fluid during the making of an analysis thereof comprising
means defining a chamber including windows provided at a set of opposed extremities of said chamber, and
flow-through supply conduit means and exhaust conduit means for the supplying and exhausting of fluid to and from said chamber during flow of fluid through the cell, said chamber having opposed walls bounding another set of opposed extremities of said chamber lying in a dimension transverse to the dimension having said windows, said supply and said exhaust conduit means communicating with said chamber through one wall of said other set of opposed walls, whereby fluid entering the chamber enters while flowing counter to the flow of fluid leaving said chamber, said supply conduit means comprising branched conduit portions with one conduit portion communicating with said chamber at one location which is adjacent one window and another conduit portion communicating with said chamber at another location adjacent the other window, said exhaust conduit means communicating with said chamber at a third location intermediate said one and said other locations.

3,926,527

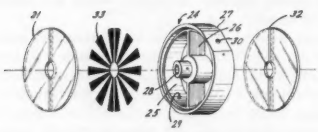
ROTATING GAS CORRELATION CELL

John D. Pembrook, Costa Mesa; Darrell E. Burch, Orange City, and Francis J. Gates, Costa Mesa, all of Calif., assignors to Philco-Ford Corporation, Blue Bell, Pa.

Filed June 5, 1974, Ser. No. 476,373
Int. Cl.² G01N *1/10*; G01J *3/48*
U.S. Cl. 356—246 **7 Claims**

1. A rotating gas correlation cell for use in a nondispersive gas analyzer, said cell comprising:

a cylindrical housing having an outer rim and an axial collar, said collar including means for attaching said housing to a shaft operative to rotate said cylinder about its axis of symmetry, a pluralilty of apertures extending through said housing parallel to and on opposite sides of the axis of said cylinder, window means sealed to the end faces of said housing to close said apertures off into sealed compartments, said compartments being adapted to contain



a quantity of gas through which radiant energy can be passed by way of said windows, at least one of said windows having associated therewith a series of radial sectors of high optical attenuation material, said sectors acting periodically to interrupt said radiant energy as said cell is rotated, fill means extending into said compartments and through said outer rim whereby said gas can be injected into said compartments and means for selectively opening and closing said fill means.

3,926,528

CARPET SHAMPOO APPARATUS

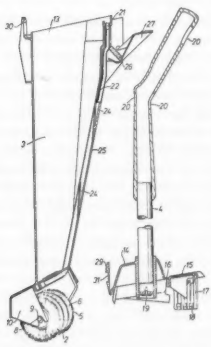
Donald Nation Smyth, South Plympton, Australia, assignor to S. A. Brush Company Limited, Albert Park, Australia

Filed Aug. 28, 1974, Ser. No. 501,053

Claims priority, application Australia, Dec. 5, 1973, 5876/73

Int. Cl.[2] A46B *11/04*

U.S. Cl. 401—274 **8 Claims**



1. A liquid shampoo apparatus for shampooing surfaces such as carpets and the like, the apparatus comprising an elongated body member, cleaning members at one end of the body member, the body member including a liquid reservoir adapted to contain the shampoo liquid, characterized by a feed reservoir in the upper end of the body member remote from the cleaning members to supply liquid to the cleaning members, and feed means comprising spaced reservoirs along a wall of the liquid reservoir whereby the surge of liquid produced by the to and fro motion during operation transfers the liquid along the spaced reservoirs to the feed reservoir.

3,926,529

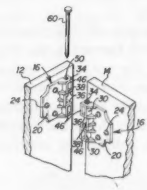
SELECTIVELY REPOSITIONABLE FASTENER

Cecil M. Brooks, Dallas, Tex., assignor to BLS Associates, Dallas, Tex.

Filed Aug. 21, 1974, Ser. No. 499,214

Int. Cl.[2] F16B *1/00;* **F16D** *1/00;* **F16L** *25/00*

U.S. Cl. 403—4 **4 Claims**



1. A fastener for rigidly connecting a pair of abutting structural members comprising:

a. a first fastener member having a support flange with a planar mounting surface contacting and attached to one of said structural members, an enlarged connecting portion extending from one end of said member, said connecting portion having two parallel spaced legs defining a slot therebetween, each of said legs having planar opposing sides defining two walls of said slot, said opposing sides extending transverse to said mounting surface, a primary locking surface connecting and extending between said opposing sides, said primary locking surface being transverse to said mounting surface and transverse to said opposing sides, a plurality of secondary locking surfaces formed on each of said legs, one of said locking surfaces being formed on the extremity of each of said legs, said one secondary locking surface extending transverse to said mounting surface and transverse to said opposing surfaces, a second secondary locking surface being formed on each of said legs in a spaced parallel relationship to said mounting surface, said legs having a width corresponding to the width of said slot, first and second aligned bores passing respectively through said legs and extending through said first and second opposing surfaces;

b. a second fastener member identical in construction to said first fastener member with the support flange of said second fastener member attached to a second structural member, one of the legs of said second fastener member inserted into the slot on said first fastener member while one of the legs of said first fastener member is inserted into the slot of said second fastener member, one of the secondary locking surfaces of said second fastener member abutting the primary locking surface of said first fastener member and one of the secondary locking surfaces of said first fastener member abutting the primary locking surface of said second fastener member, the aligned bores of said first fastener member being aligned with the bores of said second fastener member; and

c. a locking pin means inserted through said bores on said first and second fastener members thereby holding said first and second members in a fixed immovable relationship.

3,926,530

INTEGRAL CLIP CROSSMEMBER

Robert J. Deller, Cincinnati, Ohio, assignor to Pullman Incorporated, Chicago, Ill.

Filed Aug. 19, 1974, Ser. No. 498,807

Int. Cl.[2] B62D *27/00*

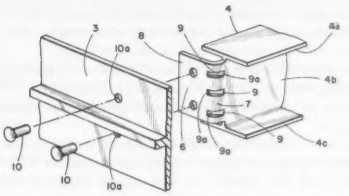
U.S. Cl. 403—167 **2 Claims**

1. For an over-the-highway trailer chassis having longitudinally extending side members,

a crossmember extending transversely therebetween and connecting with each side member,

said crossmember including an upright transverse web and a clip member at each end of the web for connecting with a respective side member,

each clip member extending outwardly from the web and including a connecting portion joining with a respective end of the crossmember and an outer end attachment portion couplable with a respective side member being joined to the connecting portion,



said connecting portion including a plurality of substantially horizontally extending and vertically spaced strengthening ribs,

said attachment portion including fastening means attaching said attachment portion to the respective side member,

said connecting portion being a radially formed and smoothly curved bent portion and said attachment portion being substantially perpendicular to said web,

said bent portion having substantially a 90° curved bend with said ribs being formed within the arcuate limits of said bend curve and generally intersecting said attachment portion and said web generally at 45°.

3,926,531

BUILDERS SCAFFOLDING

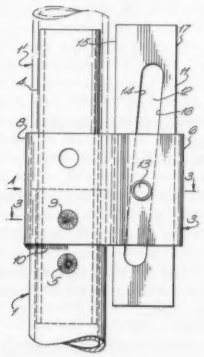
Peter Eric Gostling, Sutton Coldfield, England, assignor to C. Evans & Sons Limited, Gants Hill, England

Filed Aug. 8, 1974, Ser. No. 495,889

Claims priority, application United Kingdom, Aug. 13, 1973, 38211/73

Int. Cl.² F16B 7/04

U.S. Cl. 403—293 **5 Claims**



1. A standard for builders scaffolding which comprises a length of tube having one plain end and a head fitting fixedly secured to the other end thereof, said head fitting being adapted to receive the plain end of a second length of tube to join said tube and said second tube together in end-to-end relationship with one another, and wherein said head fitting comprises a male adaptor element fixed in and projecting coaxially from said other end of said tube to be received in said plain end of said second tube, a bracket member secured to said tube in overlapping relationship with said other end of said tube, said bracket member being formed with a narrow open slot extending radially outwards from said tube, and a wedge element positioned, and held captive, in said open slot so that, in use, said wedge element is movable between an inoperative position where one side edge thereof is spaced from the outer peripheries of said tube and said second tube being joined, and an operative position where said one side edge thereof is in direct engagement with said outer peripheries of said tube and said second tube.

3,926,532

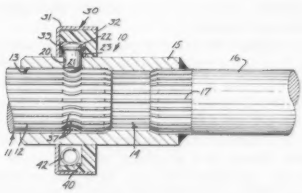
QUICK RELEASABLE COUPLING

Harold Oscar Schlenker, Aberdeen, and Fay W. Glover, Frederick, both of S. Dak., assignors to Safeguard Automotive Corporation, Aberdeen, S. Dak.

Filed Aug. 5, 1974, Ser. No. 494,792

Int. Cl.² F16B 7/00

U.S. Cl. 403—322 **1 Claim**



1. Means for quickly securing and releasing the axial engagement between a pair of coaxial members, one being hollow and having an open end to receive the other, comprising:

a plurality of radial passages extending through the hollow member at locations displaced from said open end;

a pin slidable radially in each said passage between an inward position and an outward position;

resilient means urging said pins towards said outward positions;

an annular member rotatable about said hollow member at the location of said pins and including camming surfaces operative on said pins in a first rotated position of said annular member to force said pins into said inward positions, and in a second rotated position of said member to enable said pins to be displaced by said resilient means into said outward position;

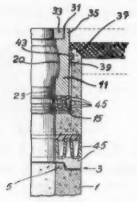
means carried by said other member for engagement by said pins in the inward positions thereof to oppose axial movement between said members;

and means limiting the extent of rotation of said annular member, including further pins projecting radially outwardly from said hollow member within said annular member, arcuate passages of limited angular and axial extent in said annular member for traversal by said further pins, and further resilient means contained in said arcuate passages and engaging said annular member and said further pins to urge said annular member into the first position thereof, said radial passages and further pins being located alternatively about the axis of said outer and inner members.

3,926,533
MANHOLE

Andre Binette, 27 rue Principale, Saint-Joseph-Du-Lac, Comte des Deux-Montagnes, Quebec, Canada

Filed July 15, 1974, Ser. No. 488,803
Int. Cl.² E02D *29/14*
U.S. Cl. 404—26 **9 Claims**

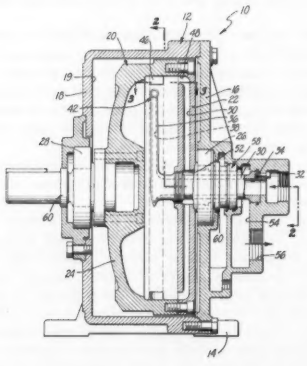


1. A system for adjusting the level of the upper edge of a manhole installed in a roadbed, comprising:
a vertical housing, adapted to be embedded in the ground, with an upper edge at a level below the level of the roadbed surface;
a first element removably mounted on the upper edge of said vertical housing;
a second element removably placed within said first element;
a flexible adjusting element, removably placed within said first element, inserted between an upper surface of said first element and a lower surface of said second element, being of a configuration having good resistance to compression forces, and provided with a cut in its whole thickness, said flexibility and said cut permitting said adjusting element to bend for said insertion between said first and second element as said second element is lifted a predetermined distance insufficient for complete removal from its place within said first element for adjusting the level of the upper edge of the manhole.

3,926,534
TURBINE

John W. Erickson, Huntington Beach, Calif., assignor to Kobe, Inc., Huntington Park, Calif.

Filed Jan. 2, 1974, Ser. No. 430,150
Int. Cl.² F04B *1/14*, *1/12*
U.S. Cl. 415—89 **7 Claims**

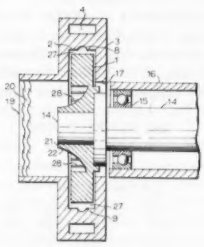


1. In a turbine, the combination of:
a. an outer housing having axially spaced ends and having an inlet for power fluid under pressure in one of said ends thereof;
b. a rotary casing in said housing and rotatable about the axis thereof and having axially spaced ends;
c. said casing having an inner peripheral surface carrying circumferentially spaced turbine blades;
d. a stationary, generally radial arm within said casing and carried by said housing;
e. said arm having a generally radial passage therein;
f. said arm having an inlet at its inner end in communication with the inner end of said radial passage;
g. inlet passage means connecting said inlet in said arm to said inlet in said one end of said housing;
h. nozzle means at the outer end of said arm, and communicating with the outer end of said radial passage, for directing a jet of power fluid under pressure at said turbine blades;
i. circumferentially spaced discharge passages in one of said ends of said casing and having outer ends in communication with the interior of said casing adjacent said inner peripheral surface thereof;
j. an outlet in said housing; and
k. discharge passage means connecting the inner ends of said discharge passages to said outlet in said housing.

3,926,535
GAS TURBINE

Jacques Morf, Ecully, France, assignor to Rhone-Poulenc-Textile, Paris, France

Filed June 19, 1974, Ser. No. 480,818
Claims priority, application France, July 17, 1973, 73.26439
Int. Cl.² F01D *1/08*
U.S. Cl. 415—203 **6 Claims**



1. A high-speed gas turbine comprising:
a casing having
a rotor chamber therein,
a turbine rotor,
compressed gas injection means including
at least one injector opening to said rotor chamber and aligned generally tangentially therewith,
a supply channel in the periphery of said rotor chamber and said supply channel being tapered from a maximum dimension adjacent said injector to a terminal point remote from said injector,
said rotor having
a plurality of blades, said blades defining
a plurality of slots between adjacent blades, said slots each having
an inlet zone on the periphery of the rotor and
an outlet spaced radially inwardly from said inlet zone, each said blade including
a convex side and
a concave side, said slots being formed by adjacent pairs of concave and convex sides, each convex side having

an inlet curved surface generally tangential to the axis of said injector at the point where said axis meets the periphery of the turbine rotor, each concave side having

an inlet convex area converging toward the inlet surface of the respective convex side at an angle of less than 20°.

3,926,536

SEMI-RIGID ROTOR SYSTEMS FOR ROTARY WING AIRCRAFT

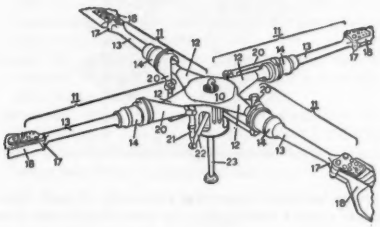
Tadeusz Leopold Ciastula, Yeovil; Victor Alfred Baden Rogers, and David Ernest Hall Balmford, both of Sherborne, all of England, assignors to Westland Aircraft Ltd., Yeovil, England

Continuation of Ser. No. 188,329, Oct. 12, 1971, abandoned. This application Jan. 18, 1974, Ser. No. 434,482

Claims priority, application United Kingdom, Oct. 15, 1970, 49006/70

Int. Cl.² B64C *27/38*

U.S. Cl. 416—135 **7 Claims**



1. A semi-rigid rotor system devoid of mechanical flap and lead-lag hinges for a rotary wing aircraft including a rotor hub, and a plurality of flexure members rigidly fixed thereto and extending outwardly therefrom, each said flexure member comprising inboard and outboard parts connected through a feathering hinge, each said inboard part being rigidly fixed to said hub and being resilient relative to its outboard part in a plane generally normal to the plane of rotation of the members and extending between the rotor hub and the feathering hinge such that the major portions of blade flapping movements are accommodated by the flexure members, the majority of which accommodated flapping movements are accommodated by resilient flexing of the inboard parts of the flexure members, each said outboard part being substantially equally resilient in a plane generally coincident with the plane of rotation of the member and in a plane generally normal to the plane of rotation of the members, but being resilient relative to its inboard part in a plane generally coincident with the plane of rotation of the members and extending from the feathering hinge to terminate in an outer end adapted for the attachment of a rotor blade such that the major portions of blade lead/lag movements are accommodated by the flexure members, the majority of which accommodated lead/lag movement is accommodated by resilient flexing of said outboard parts of the flexure members, each feathering hinge being adapted to effect rotation of the outboard part about its longitudinal axis.

3,926,537

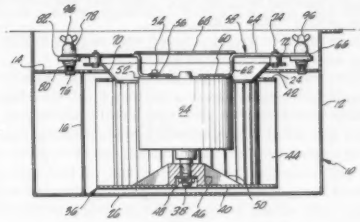
AIR BLOWER

James Piper, 1159 Fountain Way, Anaheim, Calif. 92806

Filed May 14, 1973, Ser. No. 359,705

Int. Cl.² F04B *17/00*

U.S. Cl. 417—353 **8 Claims**



1. An air blower comprising

a housing assembly;

mounting posts extending from said housing assembly;

an impeller positioned within said housing assembly;

a motor operably coupled with said impeller;

extended support means for supporting said motor, said extended support means extending outwardly from said motor to said mounting posts;

mounting blocks slidably positioned on said mounting posts and supporting said extended support means;

springs positioned about said mounting posts and supporting said mounting blocks; and

a Venturi plate suspended from said support means.

3,926,538

APEX SEAL

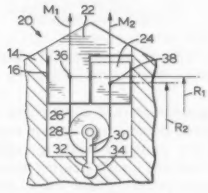
Dennis Welt, P.O. Box 314, Kitimat, B.C., Canada

Filed Apr. 17, 1973, Ser. No. 351,873

Claims priority, application Canada, Apr. 17, 1972, 139780

Int. Cl.² F01C *19/02*

U.S. Cl. 418—115 **1 Claim**



1. In a mechanism having a rotary piston mounted for rotation in a chamber about a central axis of the chamber, the piston having a plurality of apexes for dividing the chamber into a plurality of compartments, each apex being disposed on a radial axis generated from said central axis, the piston being formed to provide U-shaped slots having a bottom wall and a pair of oppositely disposed side walls, said side walls being uniformly spaced on opposite sides of one of said radial axes, the improvement of, an apex seal assembly mounted in each slot comprising;

a. an apex seal member having a pair of oppositely disposed side walls, an upper face having an apex ridge extending longitudinally thereof, a lower face and a pair of oppositely disposed end faces, said apex seal member being proportioned to fit within said apex slot such that said oppositely disposed side walls of said seal member fit in a close fitting sliding relationship within said side walls of said slot, said apex ridge being disposed on said radial axis of said apex groove, the lower face of said apex seal

member being notched to provide a recess extending upwardly upwardly into said apex seal member and extending longitudinally thereof,

b. an inertia counterbalancing weight member mounted within said slot and proportioned to project into said notch of said apex seal member, to underly a portion of said apex seal member, said inertia counterbalancing weight member being slidable within said slot in the direction of said radial axis,

c. a base member fixedly secured with respect to said bottom wall of said U-shaped slot,

d. connector means mounted on said base member for angular movement about a centre of rotation disposed within said U-shaped slot, and directly underlying said apex seal member, said connector means having opposite ends disposed within said U-shaped slot on opposite sides of said centre of rotation, one end of said connector means being connected to said apex seal member and the other end of said connector means being connected to said counterbalancing weight whereby upon rotation of said piston the centrifugal forces generated by the movement applied by said inertia counterbalancing weight member substantially balances the movement generated by said apex seal member.

3,926,539

ROTARY PISTON INTERNAL COMBUSTION ENGINE

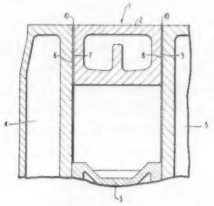
Heinz Lamm, Esslingen-St. Bernhardt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed May 8, 1973, Ser. No. 358,319

Claims priority, application Germany, May 9, 1972, 2222632

Int. Cl.[2] F01C *19/00;* **F02F** *11/00;* **F16J** *15/14*

U.S. Cl. 418—149 **17 Claims**



1. A rotary piston internal combustion engine including several rotary piston internal combustion engine housing parts having at least two mutually abutting contact surfaces and consisting of at least one housing casing means and two lateral parts, characterized in that at least one of said mutually abutting contact surfaces of the rotary piston internal combustion engine housing parts is provided with a synthetic plastic coating which coating provides a seal between said contact surfaces, which seal contacts both of said mutually abutting contact surfaces.

3,926,540

STEAM ENGINE

Bernard J. Grenier, Garden, Mich.

Filed Nov. 25, 1974, Ser. No. 527,021

Int. Cl.[2] F04C *17/04*

U.S. Cl. 418—197 **12 Claims**

1. In a steam engine, a base;

a pair of end plates thereon;

a driven shaft spanning and journalled upon said end plates;

a main rotor including a pair of spaced helicoid gears of opposite hand mounted on and secured to said shaft;

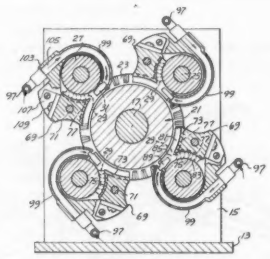
a series of spaced axles spanning and journalled upon said end plates, arranged around, outwardly of and parallel to said shaft;

a chambering rotor including a pair of spaced helicoid gears of corresponding opposite hand mounted on and secured to each of said axles;

with the spiral gear teeth of each chambering rotor in mesh with the corresponding spiral gear teeth of said main rotor;

an elongated bonnet adjacent and parallel to each chambering rotor interposed between and secured to said end plates;

said bonnet having a pair of intersecting elongated transversely arcuate surfaces adjacent said rotors providing a close running fit with the peripheries of both mating rotors throughout their length and extending circumferentially both sides of a central longitudinal plane wherein the peripheries of both rotors coincide, thence through arcs equal to those spanned by the helixes of each rotor; each bonnet sealing off the respective expansion chambers defined between and along the adjacent intermeshing chambering rotors and main rotor;



an arcuate bulkhead projecting outwardly of each bonnet arcuate surface intermediate its ends nested with a running fit within the annular space between the inner ends of the helical gears of the chambering rotor and main rotor, closing off the corresponding expansion chambers on opposite sides of the bulkhead;

said bulkheads merging at one end and terminating in a tang, chamferred upon its opposite sides defining a knife edge;

an arcuate steam duct mounted on each bonnet intermediate its ends extending around the chambering rotor and nested with a running fit between the inner ends of its helical gears and the helical gears of said main rotor;

the end of said steam duct receiving said knife edge so that steam under pressure delivered thereto is deflected laterally from both sides thereof into the ends of the said expansion chambers;

a steam manifold connected to a source of steam under pressure;

and a plurality of conduits interconnecting said manifold and the respective steam ducts.

3,926,541

EXTRUDER WITH INTERACTING AUGER AND CARE MEANS

Frederick M. Hewitt, 2913 N. Harrington, San Bernardino, Calif. 92402

Continuation-in-part of Ser. No. 50,491, June 29, 1970, abandoned. This application Jan. 11, 1973, Ser. No. 322,811

Int. Cl. B28b *1/08*

U.S. Cl. 425—64 **6 Claims**

1. Apparatus for forming concrete aricles, comprising:

a hopper, a conveyor section, a consolidation section and a molding station;

said molding station including form surfaces;

at least one auger for conveying concrete mix along said conveyor section, said auger having flights for extruding

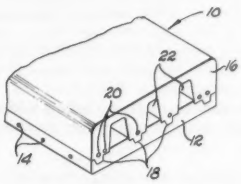
said mix through said consolidation section and into said molding station;

at least one mandrel formed by walls having external surfaces in the path of extrusion from said auger flights;

said auger being rotationally independent from said mandrel;

said auger and said mandrel being relatively disposed so that the longitudinal axis of said auger is lateral of the longitudinal axis of said mandrel;

said hopper including means for introducing concrete mix to said auger;



means for rotating said auger to convey said mix to the form surfaces of said molding station with sufficient force to consolidate said mix and extrude the consolidated mix relative to said form surface;

means for slideably securing said molding station form surfaces whereby to permit reciprocal movement along their planes; and

means for reciprocally vibrating said form surfaces along their planes at a frequency greater than 22,000 vibrations per minute, during the extrusion, to reduce friction between said form surfaces and said mix.

3,926,542

CONTINUOUS PRESS

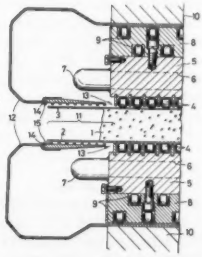
Karl-Heinz Ahrweiler, Krefeld, Germany, assignor to Eduard Kusters, Krefeld-Forstwald, Germany

Filed Sept. 4, 1973, Ser. No. 394,105

Claims priority, application Germany, Sept. 4, 1972, 2243465

Int. Cl.² B29J *5/04;* **B29C** *15/00*

U.S. Cl. 425—174.4 **8 Claims**



1. An improved continuous press including endless loops formed by conveyor belts which form opposed substantially linear spans defining a pressing zone, press platens applying pressure and heat through said travelling spans to work carried therebetween and anti-friction means interposed between said platens and said spans, said anti-friction means transmitting pressure and heat between said platens and said spans, the spans having edge portions extending laterally beyond the lateral edges of said platens and said anti-friction means; the improvement comprising means for independently regulating the temperature of said edge portions of said spans.

3,926,543

METHOD OF HEATING THE INTERIOR AND STRUCTURE OF LARGE VESSELS OR ENCLOSURES

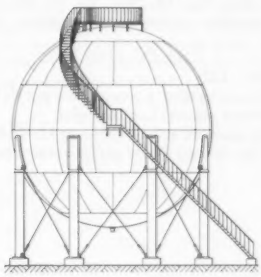
Maurice Hemingway, Mirfield, and Trevor Ward, Dewsbury, both of England, assignors to Hotwork Limited, Dewsbury, England

Filed Dec. 14, 1972, Ser. No. 314,980

Claims priority, application United Kingdom, Dec. 15, 1971, 58277/71

Int. Cl.² F23B *7/00*

U.S. Cl. 431—9 **4 Claims**



1. A method of heating the interior and structure of large enclosures utilizing the hot exhaust gases formed as the result of combustion in a burner which is externally removable with respect to the enclosure being heated, comprising injecting as a divergent stream into the interior of the enclosure at high velocity and thereby causing to be circulated within and through the interior of the enclosure, the hot gases of combustion along with diluent air or other gas so that the gas current has a total volume flow greater than that of the products of combustion alone, thereby producing and maintaining uniform elevated temperatures over at least part of the interior surface of the enclosure.

3,926,544

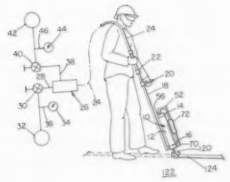
BURNER SYSTEM

Merle L. Thorpe, R.F.D. 1, Concord, N.H. 03301

Filed Dec. 30, 1974, Ser. No. 537,451

Int. Cl.² F23R *1/02;* **F23D** *11/44*

U.S. Cl. 431—114 **14 Claims**



1. A burner system comprising a source of pressurized air, a source of pressurized gaseous fuel,

a combustion chamber having an uncooled tubular wall member, and end wall structure secured to said tubular wall member at each end thereof, inlet port means in one of said end wall structures, outlet port means in the other end wall structure, the area of said outlet port means being at least 25 percent greater than the area of said inlet port means,

conduit structure for supplying a mixture of air and gaseous fuel from said sources for flow through said inlet port means to said combustion chamber at a steady state velocity in the range of 500–1500 feet per second,

and restriction structure spaced from said combustion chamber and connected to said conduit structure for restricting the flow of transient pressure waves from said combustion chamber towards said sources and damping acoustical oscillations within said combustion chamber.

3,926,545

SELF-CLEANING ELECTRICALLY IGNITED LIGHTER

Henri Gujer, Reinach, Switzerland, assignor to Diplomat AG, Birrwil, Sweden

Filed Nov. 18, 1974, Ser. No. 524,495

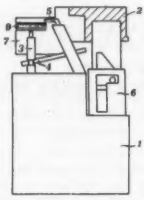
Claims priority, application Switzerland, Nov. 30, 1973, 16865/73

Int. Cl.[2] F23D *11/38*

U.S. Cl. 431—122 8 Claims

1. Lighter comprising: a controllable gas jet burner (3) and electric ignition means (5, 6) therefor;

manually operable actuating means (2, 4) for causing fuel gas to be released to gas jet burner and for producing an electric spark in said ignition means to ignite said fuel gas at said burner; cleaning means (9, 10) movable relative to said burner for cleaning the burner surfaces



thereof, and means (7, 8) linking said actuating means and said cleaning means for operating said cleaning means.

3,926,546

POLYHYDROXYALKYLAMINE SALTS OF ANIONIC DYESTUFFS

Horst Nickel, Leverkusen, and Karl-Heinz Schündehütte, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Division of Ser. No. 191,076, Oct. 20, 1971, abandoned. This application Oct. 4, 1973, Ser. No. 403,465

Claims priority, application Germany, Oct. 20, 1970, 2051303

Int. Cl.[2] D06P *1/68*

U.S. Cl. 8—12 2 Claims

1. In a process for dyeing and printing textile fiber materials of native or regenerated cellulose, wool, silk, leather, synthetic polyamides or/ and polyurethanes, the improvement comprising applying concentrated, liquid dyeing preparations in diluted form to the textile fiber materials wherein the preparation contains a salt of a dyestuff containing sulphonic acid groups with 2-amino-2-hydroxymethylpropanediol-(1,3).

3,926,547

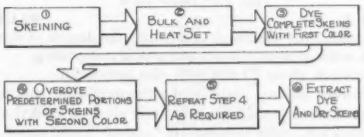
METHOD AND APPARATUS FOR SPACE DYEING YARN

Gerard M. O'Mahony, Dalton, Ga., and James G. T. Paterson, Chattanooga, Tenn., assignors to Interdye Technology Corporation, Dalton, Ga.

Filed Jan. 2, 1974, Ser. No. 429,934

Int. Cl.[2] D06B *11/00*

U.S. Cl. 8—14 16 Claims


① SKEINING
② BULK AND HEAT SET
③ DYE COMPLETE SKEINS WITH FIRST COLOR
④ OVERDYE PREDETERMINED PORTIONS OF SKEINS WITH SECOND COLOR
⑤ REPEAT STEP 4 AS REQUIRED
⑥ EXTRACT DYE AND DRY SKEINS

1. A method of producing space dyed yarns suitable for use in fabricating multi-colored tufted carpets and the like, and characterized by deep, bright colors, high bulk, and the substantial elimination of streaks on the face of the resulting carpet caused by a similar repeating color pattern on the yarns, and comprising the steps of

arranging a plurality of skeins of textile yarn to form a bank of side by side, downwardly hanging skeins,

completely immersing the bank in a first dye bath to apply a first color to the entire skeins, and then

partially immersing the bank in a second dye bath of a color different from that of the first dye bath and so that some of the skeins are partially immersed further than others to thereby apply a second color only to the immersed portions of the skeins and such that the skeins have varying color patterns.

3,926,548

SULFONATED PHENYLAMINO-HALOTRIAZINE OR-DIAZINE SURFACE MODIFIED AMINATED HYDROPHOBIC FIBERS AND BLENDS THEREOF WITH UNMODIFIED AMINATED HYDROPHOBIC FIBERS

Kazuo Moriyama; Takashi Iwato, and Morihiko Ohno, all of Takatsuki, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

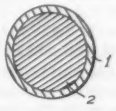
Filed Oct. 10, 1972, Ser. No. 296,207

Claims priority, application Japan, Oct. 8, 1971, 46-79786

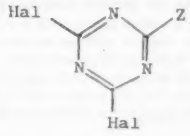
Int. Cl.[2] D06P *5/12*

U.S. Cl. 8—115.5 9 Claims

1. Hydrophobic fibers having a dye-reserving layer only on the surface of each individual fiber, produced by a method which comprises subjecting hydrophobic fibers containing amino groups to the action of a turbulent gas stream to cause exposure of the individual filaments thereof, and simultaneously therewith depositing a dye-reserving agent in mist form on the fibers, and subsequently fixing the dye-reserving



agent on the fibers by subjecting the resultant fibers to a dry heat treatment, to form said dye-reserving layer, said dye-reserving agent being a compound selected from the group consisting of compound of the formulae:



wherein Hal is fluorine, chlorine or bromine, Z is —NR-phenyl sulfonate, B is hydrogen, chlorine or fluorine and R is hdyrogen or lower alkyl.

3,926,549

CELLULOSE TERPOLYMER TEXTILES

Trinidad Mares, and Jett Clinton Arthur, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 10, 1973, Ser. No. 404,978

Int. Cl.[2] D06M *1/00*; C08L *1/00*, *5/00*

U.S. Cl. 8—116 R 21 Claims

1. A process for preparing a cellulose-terpolymer fibrous textile with wash-wear properties, the process comprising:

a. impregnating a fibrous cellulosic textile which has been dried to a moisture content below 0.5% and irradiated with gamma radiation to a dosage of about 0.5 megarad for about 60 minutes at room temperature, with an aqueous-methanolic reagent solution, respectively 80% and 20% by volume, containing a vinyl (A) monomer selected from the group consisting of acrylonitrile, methacrylonitrile, methacrylic acid, acrylic acid, and hexafluoroisopropyl acrylate, said monomer impregnation comprising a reaction condition wherein the charge comprises a part of dried and irradiated cellulosic textile, 1 part of vinyl monomer, and 8 parts of aqueous-methanol, said impregnation constituting a reaction which yields polymer add-ons of about from 2.6% to 9.4%,

b. washing the unreacted reagents off the formed cellulose copolymer with aqueous-methanol,

c. drying the cellulose copolymer to a moisture content of below about 0.5%,

d. irradiating the dried cellulosic copolymer textile product from step (c) with gamma radiation to a dosage of about 0.5 megarad,

e. impregnating the irradiated textile product of (d) with an aqueous-methanolic reagent solution, respectively 80% and 20% by volume, containing a vinyl monomer (B) different than that employed in step (a) and selected from the group consisting of acrylonitrile, methacrylonitrile, methacrylic acid, acrylic acid, and hexafluoroisopropyl acrylate, said monomer impregnation comprising a reaction condition wherein the charge comprises 1 part of dried and irradiated cellulosic textile, 1 part of vinyl

monomer, and 8 parts of aqueous-methanol, said impregnation constituting a reaction which yields (B) polymer add-ons of about from 0.44% to 20%, and

f. washing the unreacted reagents off the formed cellulose terpolymer with aqueous-methanol.

3,926,550

COTTON-TUNG OIL DURABLE-PRESS TEXTILES WITH HIGH FLEX ABRASION RESISTANCE

James A. Harris, Pearl River, and Jett C. Arthur, Jr., Metairie, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 26, 1974, Ser. No. 527,399

Int. Cl.[2] D06M *13/02, 13/20*

U.S. Cl. 8—116 R **13 Claims**

1. A process for imparting to cotton fabrics improved durable-press properties, the process comprising:

a. impregnating a cotton fabric with a 10–30% solution of tung oil in an organic solvent selected from the group consisting of N,N-dimethylformamide, methyl ethyl ketone, a 50—50 mixture of N,N-dimethylformamide and acetone, and a 50—50 mixture of N,N-dimethylformamide and petroleum ether, to a wet pickup of about from 80 to 120%,

b. drying the impregnated fabric of (a) with heat applied at about 140°F. for about 3 minutes,

c. curing the dried fabric at about from 200° to 300°F. for about from 2 to 8 minutes,

d. washing the cured fabric in organic solvent selected from the group consisting of N-N-dimethylformamide, methyl ethyl ketone, or a mixture thereof, and

e. drying the cured and washed cotton-tung oil fabric thus produced.

3,926,551

METHOD OF MAKING DURABLE ANTISTATIC AND HYGROSCOPIC POLYESTER FIBERS

Toshio Okada, Kadoma; Yasunao Shimano, Takatsuki, and Ichiro Sakurada, Kyoto, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Nov. 27, 1972, Ser. No. 309,686

Claims priority, application Japan, Nov. 26, 1971, 46-94533; Nov. 26, 1971, 46-94534

Int. Cl. D06m *13/20*

U.S. Cl. 8—115.5 **6 Claims**

1. A method of imparting durable antistatic and hygroscopic properties to a polyester fiber material comprising ethylene terephthalate component, which comprises treating the fiber material with a mixture of one weight part of poly (ethylene glycol) dimethacrylate and/or diacrylate, the molecular weight of said poly (ethylene glycol) group being about 300–10,000, and 1 part or less by weight of an alkali metal salt and/or ammonium salt of an ethylenically unsaturated organic acid and then forming a water-insoluble polymer on the surface and inside of the fiber material.

3,926,552

WET TREATMENT PROCESS FOR TEXTILES

Kurt Bruckner, Berggartenstr. 30, 6123 Bad Konig, Odenwald, Germany

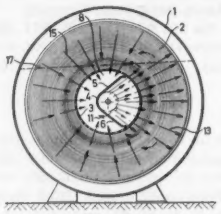
Filed Aug. 17, 1973, Ser. No. 389,359

Claims priority, application Germany, Aug. 22, 1972, 2241121

Int. Cl.[2] D06B *5/16*

U.S. Cl. 8—155.1 **12 Claims**

1. A process for the wet treatment of a roll of textile material comprising passing a liquid from a source thereof in a substantially radially outward direction through a first segment zone of said roll; relatively rotating said source and said roll to cause said first zone to traverse the entire circumferential confines of said roll; and returning liquid passed through



said roll at said first zone substantially radially inwardly of said roll at a second segment zone.

3,926,553

METHOD OF RENDERING POLYOLEFINS DYEABLE WITH ANIONIC DYES

Ronald W. Fuest, Kinnelon, N.J., assignor to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 8,086, Feb. 2, 1970, Pat. No. 3,744,968. This application Oct. 13, 1972, Ser. No. 297,544

Int. Cl.[2] D06P *5/04*

U.S. Cl. 8—169 **49 Claims**

1. A method of selectively controlling the degree of dyeability with anionic dyes of a shaped article comprising:

A. between about 93 and 99% of a polyolefin

B. between about 1 and 7% of a thermoplastic, thermostable, extra-or intralinear polymeric alkyl or aralkyl amine having a K_b value between 10^{-3} and 10^{-6}, said amine-containing polymer being capable of binding anionic and disperse dyes; said method comprising contacting said composition prior to absorption of an anionic dye by said shaped article with an anionic surfactant selected from the group consisting of

D. a strong acid water soluble anionic surfactant having the general formula (R—A), wherein R is an alkyl, aryl, alkylaryl or polyoxyalkylene group having from about 6 to 40 carbon atoms per A group, and A is an anionic group, the acid form of which has an acid dissociation constant greater than about 10^{-3}, said surfactant treatment resulting in inhibition of dyeability and

E. a weak acid anionic surfactant which is water soluble at a pH less than 7 and which has the general formula (R—A) wherein R is an alkyl, aryl, alkylaryl or polyoxyethylene group having from about 6 to 40 carbon atoms per A group, and A is an anionic group the acid form of which has an acid dissociation constant of between about 10^{-4} and 10^{-6}, said treatment resulting in increased dyeability with anionic dyes.

3,926,554

METHOD OF DYEING TEXTILE MATERIAL MADE OF SYNTHETIC FIBRES

Manfred Schuierer, Zell, Germany, assignor to Bruckner Apparatebau GmbH, Erbach, Odenwald, Germany

Filed Oct. 11, 1973, Ser. No. 405,665

Claims priority, application Germany, Nov. 10, 1972, 2254983

Int. Cl.[2] D06P *5/00, 1/90*

U.S. Cl. 8—174 **14 Claims**

1. A method of dyeing textile material made of synthetic fibres, comprising the step of contacting the material with an aqueous dye liquor containing 20 to 50 ml. of methylene chloride per liter of dye liquor.

3,926,555
MODIFICATION OF COTTON TEXTILES AND COTTON/POLYESTER TEXTILE BLENDS BY PHOTO-INITIATED POLYMERIZATION OF VINYLIC MONOMERS

Alden H. Reine, New Orleans; Jett C. Arthur, Jr., Metairie, both of La., and Norman A. Portnoy, Parsippany, N.J., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 16, 1973, Ser. No. 342,133
Int. Cl.² D06M *13/34*
U.S. Cl. 8—189 **8 Claims**

1. A method of imparting improved physical properties to cellulosic textiles, the method comprising:

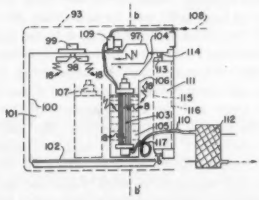
a. impregnating a cellulosic textile with an aqueous 7 to 20% by weight vinyl monomer solution, and

b. irradiating with near-ultraviolet light of a wavelength of about from 3000 to 4000 Angstroms for about from 3 to 90 minutes.

3,926,556
BIOCIDAL ELECTROMAGNETIC SYNERGISTIC PROCESS

Raymond Marcel Gut Boucher, 200 E. 64th St., New York, N.Y. 10021

Filed May 30, 1973, Ser. No. 365,287
Int. Cl.² A61L *13/00*; **A23C** *3/06*; **A23L** *3/28*, *3/32*
U.S. Cl. 21—54 R **8 Claims**



1. A rapid biocidal synergistic method of sterilizing or pasteurizing liquid containing living microorganisms such as pathogenic gram positive and gram negative bacteria, hydrophilic and lipophilic viruses and pathogenic fungi while maintaining the temperature below about 100°C, comprising establishing a thin body of liquid to be sterilized having a thickness in the range of from about 0.05 mm to about 13 mm, and subjecting the body of liquid to simultaneous irradiation with ultraviolet energy having a wave length of from about 40 Angstroms to about 3100 Angstroms and an intensity at liquid interface greater than 1 milliwatt/sec./cm², and with microwave energy having a density not greater than about 0.025 watt/cm³ and a wave length of from about 1 cm to about 35 cm.

3,926,557
IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINES

Dieter Callies, Jugenheim; Gunter Frank, and Siegbert Graf vom Hagen, both of Bensheim, all of Germany, assignors to Kyberna GmbH, Germany

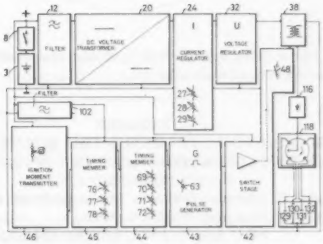
Filed Aug. 20, 1973, Ser. No. 389,516
Claims priority, application Austria, Aug. 21, 1972, 7180/72; Mar. 6, 1973, 1982/73
Int. Cl.² F02P *1/00*
U.S. Cl. 123—148 E **24 Claims**

1. In combination with an internal combustion engine having a crank shaft and a cylinder containing a piston, an ignition device comprising:

a. an ignition transformer;

b. a timing member for providing an output which is a function of the position of said piston in said engine cylinder;

c. a pulse generator, coupled to said timing member, including an astable multivibrator having first and second NAND gates each having first and second inputs and an output, a first inverter and a first capacitor coupled between the first input of said first NAND gate and the second input of said second NAND gate, second and third inverters and a second capacitor coupled between the output of said first NAND gate and the second input of said second NAND gate, first and second resistors coupled between the input of said first inverter and the input



of said third inverter, and a fourth inverter and third capacitor coupled between the first input of said second NAND gate and the second input of said first NAND gate, said timing member turning on and off said pulse generator;

d. a switching transistor coupled to said pulse generator, said switching transistor coupling said ignition transformer to a source of d.c. voltage, the switching frequency of said transistor being determined by said pulse generator to control the start, end and duration of the production of ignition arc energy; and

e. a half-wave rectifier circuit including a rectifier coupled with a secondary winding of said ignition transformer.

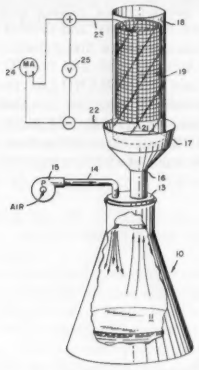
3,926,558
METHOD FOR MEASURING CONVERSION EFFICIENCY OF CATALYSTS

Robert E. Davis, 125 Hillside, Hinsdale, Ill. 60521

Filed July 5, 1973, Ser. No. 376,371
Int. Cl.² G01N *31/10*, *31/12*, *33/22*; **H01M** *8/22*
U.S. Cl. 23—230 R **4 Claims**

1. A method of measuring the hydrocarbon conversion efficiency of a catalyst system on a substrate comprising: passing a gaseous hydrocarbon fuel mixture along said cata-

lyst-bearing substrate; and measuring an electrical signal at spaced locations of different temperature on said substrate,



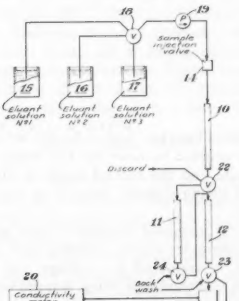
said signal being representative of the hydrocarbon conversion efficiency of said catalyst.

3,926,559

METHOD AND APPARATUS FOR QUANTITATIVE CHROMATOGRAPHIC ANALYSIS OF CATIONIC SPECIES

Timothy S. Stevens, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 6, 1973, Ser. No. 386,262
Int. Cl.² G01N *27/08, 31/04, 31/08*
U.S. Cl. 23—230 R **17 Claims**



1. The method of chromatographic quantitative analysis of a plurality of species of cations in sample solution, which comprises:

adding a predetermined amount of said sample solution to a cation exchange resin bed means, said resin bed means containing a cation exchange resin, and chromatographically separating said plurality of species of cations on eluting said cation species from the said resin bed means with an aqueous solution of a mixture of developing reagents, said mixture being selected from the group consisting of (1) soluble silver salt and highly dissociated acid; the anion of said acid not forming an aqueous-insoluble ion pair with silver ion and neither the anion of said silver salt nor the anion of said acid forming an aqueous-insoluble ion pair with any of the cation species at the concentration thereof in said sample solution, said mixture providing Ag^+ and H^+ and (2) soluble barium salt and highly dissociated acid, the anion of said acid not forming an aqueous-insoluble ion pair with barium ion and neither the anion of said barium salt nor the anion of said acid forming an aqueous-insoluble ion pair with any of the cation species at the concentration thereof in said sample solution, said mixture providing Ba^{++} and H^+, the cation exchange resin and the mixture of developing reagent being preselected to cooperatively facilitate chromatographic separation of said cation species;

passing the effluent from the cation exchange resin bed means through a first anion exchange resin bed means, said first anion exchange resin bed means containing an anion exchange resin in a form capable of precipitating whichever metal ion is provided by the developing reagent, the form being selected from the group consisting of chloride and sulfate, the exchange capacity of the anion exchange resin being at least sufficient to substantially precipitate all of the metal ion contained in the solution of developing reagents, the nature of the first anion exchange resin and the configuration of the bed thereof being preselected to not destroy the said chromatographic separation;

passing the effluent from the first anion exchange resin bed means through a second anion exchange resin bed means containing an anion exchange resin in the hydroxide form, the exchange capacity of the resin in said second bed being at least sufficient to neutralize all of the hydrogen ion in the effluent from the first anion exchange resin bed and derived from the solution of developing reagents used in the chromatographihc separation in the cation exchange resin bed means, the nature of the second anion exchange resin and the configuration of the bed thereof being preselected to not destroy the said chromatographic separation, thereby in said two anion exchange resin bed means effectively converting all of said mixture of developing reagents to weakly ionized form;

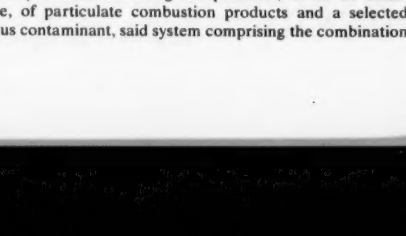
and quantitatively detecting each separated cation species exiting from said second anion exchange resin bed means.

3,926,560

SYSTEM FOR DETECTING GASEOUS CONTAMINANTS IN AIR

William O. Gentry, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 30, 1973, Ser. No. 411,128
Int. Cl.² G01N *27/62, 33/00;* **G08B** *21/00*
U.S. Cl. 23—254 E **10 Claims**



1. A system for detecting the presence, in an air atmosphere, of particulate combustion products and a selected gaseous contaminant, said system comprising the combination

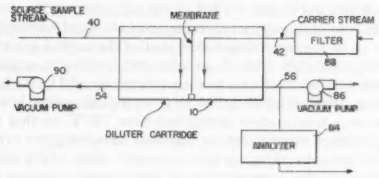
of a first electrode and a second perforate electrode defining a chamber within which said first electrode is disposed and which is open to ambient atmosphere; a radioactive source for dissociating air molecules within said chamber; circuit means connected across said electrodes for establishing current flow therebetween when air molecules are dissociated within said chamber; and means for introducing to said chamber a vapor having the property of chemcially reacting with said gaseous contaminant to form particles.

3,926,561

GAS ANALYSIS EMPLOYING SEMI-PERMEABLE MEMBRANE

Daniel P. Lucero, Triangle, Va., assignor to Meloy Laboratories, Inc., Springfield, Va.

Filed May 13, 1974, Ser. No. 469,467
Int. Cl.[2] G01N *31/08, 1/22;* **B01D** *53/22*
U.S. Cl. 23—232 R **32 Claims**



1. Fluid sample analysis apparatus comprising means defining first and second fluid flow paths separated by a wall saturable to different sample constituents at different rates, means for alternately supplying to said first flow path a fluid sample to be analyzed and a flush fluid, means for supplying a carrier fluid to said second flow path, whereby said sample constituents which permeate said wall are introduced to said carrier fluid to form a fluid mixture, and detector means for detecting the presence of sample constituents in said mixture at different times dependent upon the corresponding saturation rates.

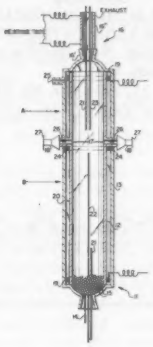
3,926,562

VERTICAL TUBE COMBUSTION REACTOR

Frederick W. Williams, Oxon Hill, and Ronald S. Sheinson, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 287,328, Sept. 8, 1972, abandoned. This application Aug. 23, 1974, Ser. No. 500,208
Int. Cl.[2] G01N *31/12;* **H05B** *1/00;* **F23D** *21/00*
U.S. Cl. 23—253 PC **12 Claims**

1. An apparatus for the study of combustion comprising:
an upright hollow transparent cylinder having a restricted lower opening and a restricted upper opening;
a chimney within said upper opening;
an outer transparent jacket sealingly engaged to said cylinder thereby permitting the pressurization or evacuation between said cylinder and said jacket;
an electrically conductive semi-transparent coating substantially covering said cylinder for resistive heating of said cylinder;
a first electrical contact on said cylinder above said lower opening whereby electrical contact is made with said coating;
a second electrical contact on said cylinder below said upper opening whereby electrical contact is made with said coating;
an inert retaining means located inside said cylinder and



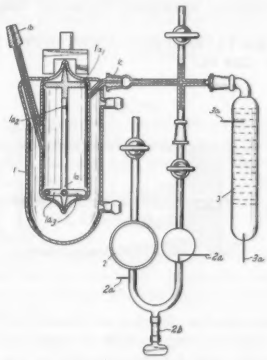
above said lower opening; and
a quantity of porous inert material on said retaining means.

3,926,563

APPARATUS FOR MEASUREMENT OF VOLUMETRIC CHANGES DURING CHEMICAL REACTIONS, NAMELY OXIDATION REACTIONS

Ludovít Kotulák, Prague and Jiří Svantner, Unhost, both of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed June 10, 1974, Ser. No. 477,843
Claims priority, application Czechoslovakia, June 12, 1973, 4248-73
Int. Cl.[2] G01N *7/18, 27/44, 31/06*
U.S. Cl. 23—255 E **7 Claims**



1. An apparatus for measurement of volumetric changes at constant pressure, which comprises
a. a closed reaction chamber where a chemical reaction occurs;
b. a pressure equalizer joined to said chamber through a tube;
c. a pressure sensor joined to said chamber through tube;
d. an electronic switching device joined to an input of said pressure equalizer and to an output of said pressure sensor; and
e. said electronic switching device electrically communicating with an input of an integrating unit which measures an

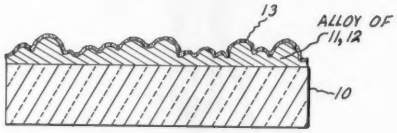
integral function of gas consumption in dependence on time.

3,926,564

SUBSTRATE FOR IMMUNOLOGICAL TESTS AND METHOD OF FABRICATION THEREOF

Ivar Giaever, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 25, 1974, Ser. No. 445,204
Int. Cl.² G01N 21/06, 33/16
U.S. Cl. 23—259 26 Claims



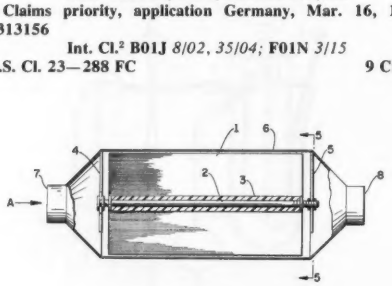
1. A medical diagnostic device comprising:
a substrate member and
a composite metallized coating attached to the surface of said substrate member, said coating containing an alloy having a noble metal constituent and an oxidizable metallic constituent and having present in the outer surface thereof oxide content derived from said oxidizable metallic constituent, said coating being free of oxide of said noble metal constitutent.

3,926,565

APPARATUS FOR CLEANING EXHAUST GASES

Gerhard Birtigh, Frankfurt; Horst Parbel, Gelnhausen, and Heinrich Sauer, Grossauheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, Germany

Filed Mar. 12, 1974, Ser. No. 450,518
Claims priority, application Germany, Mar. 16, 1974, 2313156
Int. Cl.² B01J 8/02, 35/04; F01N 3/15
U.S. Cl. 23—288 FC 9 Claims



1. An apparatus for cleaning an exhaust gas comprising an elongated metal housing capable of receiving a catalyst ceramic monolith, said housing provided at one end with an exhaust gas entry opening, and provided at the other end with an exhaust gas discharge opening, at least two bridge means spaced apart within said housing and attached to said housing, at least one supporting rod for said monolith, said rod secured to one of said bridge means and movably mounted on another of said bridge means, a ceramic monolith catalyst element having flow channels for conveying the exhaust gas from the entry opening to the discharge opening and at least one bore for receiving said at least one support rod and the largest cross-sectional dimension of said ceramic being smaller than the adjacent respective internal cross-sectional dimension of said housing to form a space therebetween, said bore being provided in the direction of said flow channels, and an elastic, intermediate layer surrounding said at least one supporting rod and held thereon by said layer being under pressure.

3,926,566

PROCESSING ALKALI METAL HALIDE SALTS FOR GROWING INTO CRYSTALS IN ACCORDANCE WITH STOCKBARGER PROCESS

Richard W. Spurney, Solon, Ohio, assignor to Bicron Corporation, Newbury, Ohio

Continuation-in-part of Ser. No. 361,656, May 18, 1973, abandoned. This application Sept. 12, 1974, Ser. No. 505,475
Int. Cl.² B01D 9/00; C01D 3/12; B01J 17/08
U.S. Cl. 23—301 SP 4 Claims

1. In the growing of alkali metal halide salt crystals by the Bridgeman-Stockbarger process, the steps of purifying the halide salt to obtain a hot slurry, drawing off most of the mother liquor from the purified halide salt slurry by a vacuum filtration process to leave a hot damp salt, placing the damp salt in contamination-proof metal trays of identical but slightly smaller cross-sectional shape than that of the crystal-growing crucible, putting the trays in an oven and holding them there for at least 15 hours at a temperature in excess of 212°F., long enough to drive off all of the water from the salt cakes, lowering the oven temperature to not less than 200°F. so that the salt cakes thus formed can be handled, removing the cakes from the trays, breaking up into a powder some of the cakes and filling up the cone portion of the crucible, placing the remaining hot cakes in the crucible and filling the cracks and interstices with the remaining powder to obtain as much salt in the crucible as feasible, and thereafter growing the crystal.

3,926,567

CERMET COMPOSITION AND METHOD OF FABRICATION

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Wayne M. Phillips, La Crescenta, Calif.

Filed Apr. 5, 1973, Ser. No. 348,422
Int. Cl.² C04B 35/70
U.S. Cl. 29—182.5 15 Claims

1. A high strength cermet composition comprising a sintered body consisting of high temperature resistant metal or metal alloy particles coated with and dispersed in a continuous matrix of ceramic oxide, said metal or metal alloy particles comprising two different metals, one of said metals being present in a small amount, said last mentioned metal corresponding to the metal of at least one metal oxide of said ceramic oxide.

3. A high strength cermet composition comprising a sintered body consisting of high temperature resistant metal or metal alloy particles coated with and dispersed in a continuous matrix of ceramic oxide, said metal and metal alloy particles being selected from the group consisting of niobium, niobium alloys containing a small amount of metal of the group consisting of zirconium, aluminum and yttrium; nickel, iron, chromium, cobalt, tantalum, tungsten, molybdenum, aluminum and magnesium, said ceramic oxide being selected from the group consisting of alumina, yttria, zirconia, and mixtures thereof, zirconia in combination with an oxide of the group consisting of calcium oxide and magnesium oxide; titanium dioxide, tantalum oxide, vanadium oxide, niobium oxide and chromium oxide.

3,926,568

HIGH STRENGTH CORROSION RESISTANT NICKEL-BASE ALLOY

John Stanwood Benjamin, and Jay Ward Schultz, both of Suffern, N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. Nos. 375,530, July 2, 1973, abandoned, and Ser. No. 302,201, Oct. 30, 1972, abandoned. This application Aug. 28, 1974, Ser. No. 501,052

Int. Cl.[2] C22C *29/00, 19/05*

U.S. Cl. 29—182.5 12 Claims

1. A mechanically alloyed dispersion strengthenable, precipiation hardenable powder consisting essentially of about 13 to 17% chromium, about 2.5 to 6% aluminum, about 2 to 4.25% titanium, about 1.75 to 4.5% molybdenum, about 3.75 to 6.25% tungsten, about 0.02 to 0.5% zirconium, about 0.001 to 0.025% boron, yttria in a small but effective amount to enhance high temperature strength characteristics, up to 4% tantalum, up to 0.2% carbon and the balance essentially nickel.

3,926,569

MULTIPLE METALLIC LAYERS INCLUDING TIN-COBALT-CONTAINING ALLOY LAYER

Jacob M. Hage, Farmington, Mich., assignor to Midwest Chrome Process Company, Detroit, Mich.

Division of Ser. No. 249,850, May 3, 1972, Pat. No. 3,884,116, which is a continuation-in-part of Ser. No. 208,080, Dec. 15, 1971, abandoned. This application Jan. 14, 1974, Ser. No. 432,862

Int. Cl.[2] B32B *15/02, 15/00, 15/18, 15/20*

U.S. Cl. 29—194 19 Claims

16. The invention of claim 15 wherein,

the base metal is a material selected from the group consisting of steel, brass, titanium, aluminum, zinc, or stainless steel.

3,926,570

ELECTRICALLY CONDUCTIVE COMPOSITIONS OF MATTER

Alan D. Wilks, Mount Prospect, and Karl J. Youtsey, Chicago, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 4, 1974, Ser. No. 448,113

Int. Cl.[2] B32B *15/04*

U.S. Cl. 29—195 8 Claims

1. A metallized conductive pigment comprising a particulate refractory oxide substrate having a surface area greater than 10 square meters per gram and up to about 500 square meters per gram and a particle radius size of less than 10 microns, said substrate having a base metal selected from the group consisting of copper, nickel, tin and aluminum deposited thereon, the surface of said base metal being coated with a noble metal.

3,926,571

METALLIZED ISOTROPIC BORON NITRIDE BODY

William H. Labossier, Billerica, and Hartmut Schilling, Acton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 320,044, Jan. 2, 1973, abandoned, which is a division of Ser. No. 217,656, Jan. 13, 1972, Pat. No. 3,853,582, which is a continuation of Ser. No. 8,053, Feb. 2, 1970, abandoned. This application Sept. 3, 1974, Ser. No. 502,684

Int. Cl.[2] B32B *15/04*

U.S. Cl. 29—195 7 Claims

1. A transition zone between a metal and an isotropic boron nitride body consisting of a portion of the surface of said isotropic boron nitride body and an alloy consisting of measurable amounts of a first material selected from at least one of the group consisting of zirconium, titanium, and hafnium, dissolved in measurable amounts of a second material selected from at least one of the group consisting of nickel, platinum, copper, gold, and silver.

3,926,572

ALUMINIZED STEEL

Frank C. Dunbar, Monroe, and Kasimir Oganowski, Middletown, both of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Continuation of Ser. No. 320,523, Jan. 2, 1973, abandoned. This application Aug. 29, 1974, Ser. No. 501,765

Int. Cl.[2] B32B *15/18*

U.S. Cl. 29—196.2 7 Claims

1. A steel base sheet hot dip coated with a coating consisting essentially of substantially pure aluminum, said aluminum coated sheet having excellent reverse bend coating adherence and exhibiting no coating delamination during heating to a temperature on the order of 1,000°F., said coated sheet being characterized by an interface iron-aluminum alloy layer having a weight less than 0.45 ounces per square foot of coated sheet, and a continuous layer of unalloyed aluminum above said alloy layer, said unalloyed aluminum layer having a weight in the range of 0.10 to 0.25 ounces per square foot of coated sheet, the total weight of said interface iron-aluminum alloy layer and said unalloyed aluminum layer being less than about 0.60 ounces per square foot of coated sheet, whereby to provide an aluminized steel base sheet particularly suitable for enamel coating.

3,926,573

COMPOSITE WIRE AND METHOD OF MAKING

Peter Sexton, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 18, 1970, Ser. No. 73,671

Int. Cl.[2] B32B *15/02, 15/20*

U.S. Cl. 29—197 2 Claims

1. A composite metal wire comprising a core of aluminum material having a selected annealing temperature and a cladding of a copper material having an annealing temperature which is relatively higher than the lowest annealing temperature of said aluminum material, said core material being in substantially fully annealed condition, said cladding material being metallurgically bonded to said core and being in substantially fully work-hardened condition.

3,926,574

MOLYBDENUM BASED SUBSTRATE COATED WITH HOMOGENEOUS MOLYBDENUM TRIALUMINIDE

Seymour Priceman, Seaford, N.Y., assignor to DeWiant Corporation, Detroit, Mich.

Filed June 21, 1971, Ser. No. 155,228

Int. Cl.[2] B32B *15/00*

U.S. Cl. 29—197 5 Claims

1. A composite consisting essentially of a molybdenum based substrate and metallurgically bonded to said substrate a relatively thin, metallurgically homogeneous layer of molybdenum trialuminide.

3,926,575

REMOVAL OF PYRITIC SULFUR FROM COAL

Robert A. Meyers, Encino, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed July 19, 1971, Ser. No. 164,006

Int. Cl.[2] C10L *9/00;* C10B *17/00, 57/00*

U.S. Cl. 44—1 R 6 Claims

1. A process for reducing the pyrite sulfur content in coal which comprises:

reacting the coal containing FeS_2 with an effective amount of an aqueous solution of sulfurous acid at about 100°C to 140°C and hydrochloric acid to form free sulfur in the coal matrix;

filtering the solution from the coal;
washing the coal; and
removing the free sulfur from the coal.

3,926,576

PROCESS FOR PRODUCING HOT BRIQUETTES

Paul Schmalfeld, Bad Homburg; Dieter Sauter, Frankfurt am Main; Werner Peters, Wattenscheid; Erwin Ahland, Essen; Burkhard Bock, Duisburg, and Joachim Lehmann, Essen-Haarzopf, all of Germany, assignors to Bergwerksverband GmbH, Essen-Kray and Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, both of, Germany

Filed May 7, 1973, Ser. No. 358,199

Claims priority, application Germany, May 12, 1972, 2223078; Mar. 8, 1973, 2311348

Int. Cl.[2] C10L *5/00, 5/16, 5/40*

U.S. Cl. 44—10 H **29 Claims**

1. Process for producing hot briquettes which comprises:

a. forming a premixture of caking coal with tar pitch,

b. mixing the premixture of step (a) with hot coke forming a mixture having a temperature in the range of 420°–550°C. and containing 2–10 weight percent tar pitch and 20–50 weight percent of caking coal, and

briquetting the mixture of step (b) in a double-roll press to form said hot briquettes.

20. Process for producing hot briquettes which comprises mixing fine-grained hot coke or anthracite having a temperature in the range of 600°–900°C solely with 10–30 percent by weight tar pitch to produce a mixture having a temperature in the range of 400°–550°C. and briquetting said mixture on a double-roll press.

3,926,577

CORROSION INHIBITOR FOR VANADIUM-CONTAINING FUELS

Michael J. Zetlmeisl; Walter R. May, and Robert R. Annand, all of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Aug. 6, 1973, Ser. No. 386,228

Int. Cl.[2] C10L *1/32, 1/12, 1/30*

U.S. Cl. 44—51 **10 Claims**

1. A composition of matter consisting essentially of calcium and aluminum in a weight ratio of Ca/Al of about $\frac{1}{3} \pm 2$ calculated as metal weights.

2. The composition of claim **1** which also contains silicon.

3,926,578

HYDROCARBYL AMINE SUBSTITUTED PROPIONIC ESTER AND MOTOR FUEL COMPOSITION CONTAINING SAME

William M. Cummings, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 18, 1974, Ser. No. 533,909

Int. Cl.[2] C10L *1/22*

U.S. Cl. 44—58 **6 Claims**

1. A motor fuel composition comprising a mixture of hydrocarbons in the gasoline boiling range containing from about 0.001 to 0.1 wt. percent of a hydrocarbylamine ester represented by the formula:

$$RR'NCH_2CH_2COOR''$$

in which R is an aliphatic hydrocarbon radical having from about 12 to 22 carbon atoms, R′ is hydrogen or a lower aliphatic hydrocarbon radical having from 1 to 2 carbon atoms and R″ is hydrocarbon radical having from 8 to 22 carbon atoms.

3,926,579

PETROLEUM CRUDE OILS CONTAINING POLYMERS COMPRISED OF C_{18}–C_{40} ALPHA-OLEFINS HAVE REDUCED TENDENCY TO DEPOSIT WAX

Albert Rossi, Jersey City; Norman Jacobson, East Brunswick, and Harold N. Miller, Millington, all of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 762,368, Sept. 16, 1968, abandoned. This application Mar. 23, 1973, Ser. No. 344,428

Int. Cl. C10l *1/16*

U.S. Cl. 44—62 **4 Claims**

1. An oil composition consisting essentially of a petroleum crude oil containing in the range of 0.0005 to 0.45 wt. % of a flow improving, oil-soluble copolymer prepared by using a Ziegler type polymerization catalyst and consisting essentially of 60 to 80 wt. % of a higher alpha mono-olefin selected from the group consisting of eicosene, docosene, and mixtures of C_{22} to C_{28} olefin; and 40 to 20 wt. % of a lower alpha mono-olefin having 4 to 6 carbon atoms, said copolymer being substantially free of diene monomers, and having a number average molecular weight in the range of about 500 to 125,000.

3,926,580

FUEL COMPOSITIONS AND ADDITIVE MIXTURES FOR ALLEVIATION OF EXHAUST GAS CATALYST PLUGGING

Marcelian F. Gautreaux, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed June 27, 1974, Ser. No. 483,641

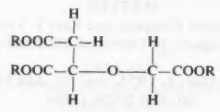
Int. Cl.[2] C01L *1/18*

U.S. Cl. 44—68 **40 Claims**

1. As a composition of matter, a gasoline for an internal combustion engine comprising

i. about 0.005 – 10 grams of manganese per gallon as a cyclopentadienyl manganese tricarbonyl wherein said cyclopentadienyl group is a hydrocarbon group containing 5–17 carbon atoms, and

ii. amount sufficient to reduce the plugging of an exhaust gas catalyst of a compound having the general formula:



wherein R is independently selected from hydrogen and hydrocarbyl radicals.

3,926,581

FUEL COMPOSITIONS AND ADDITIVE MIXTURES FOR REDUCING THE PLUGGING OF EXHAUST GAS CATALYSTS

Larry Plonsker, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed June 27, 1974, Ser. No. 483,642

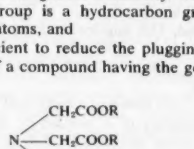
Int. Cl.[2] C10L *1/22*

U.S. Cl. 44—68 **40 Claims**

1. As a composition of matter, a gasoline for an internal combustion engine comprising

i. about 0.005–10 gms of manganese per gallon as a cyclopentadienyl manganese tricarbonyl wherein said cylopentadienyl group is a hydrocarbon group containing 5–17 carbon atoms, and

ii. amount sufficient to reduce the plugging of an exhaust gas catalyst of a compound having the general formula:



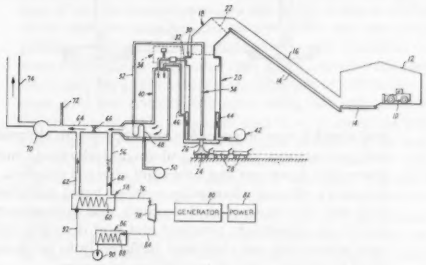
wherein R is independently selected from hydrogen and hydrocarbyl radicals.

3,926,582

METHOD AND APPARATUS FOR PYROLYTIC TREATMENT OF SOLID WASTE MATERIALS

Orlo A. Powell, Jr., Wethersfield, and Angelo J. Roncari, East Granby, both of Conn., assignors to Urban Research & Development Corporation, East Granby, Conn.

Filed Jan. 5, 1973, Ser. No. 321,449
Int. Cl. C10b *51/00, 57/04*
U.S. Cl. 48—62 **36 Claims**



1. In a method for disposing of and converting solid waste material, the steps comprising:

A. providing a substantially vertical pyrolysis chamber;

B. charging solid waste material having organic and inorganic components into the upper region of said pyrolysis chamber, said solid waste material containing as minimum weight values, about 2.0 per cent of glass and ceramics, 18.0 per cent of paper products, 3.0 per cent of metals and 6.0 per cent of food waste and other organic materials;

C. charging under pressure an oxygen-rich gas into said chamber at a plurality of vertically spaced points along the length thereof so as to produce combustion of said organic components and generate heat while controlling the charging of said oxygen-rich gas at said plurality of points to maintain a plurality of different and downwardly increasing temperature zones adjacent said plurality of vertically spaced points along the length of said chamber so as to effect incomplete combustion of said organic component and form a combustible gas in the upper zones and to melt and oxidize the inorganic components of said waste material into an organic-free molten refractory material in the lowermost zone, the temperature of said molten refractory material at the lower region of said pyrolysis chamber being at least about 1075° Centigrade; and

D. removing said combustible gas from said upper region of said pyrolysis chamber and said molten refractory material from said lower region thereof.

22. Apparatus for disposing of solid waste comprising:

A. a reactor having a shell providing a substantially vertical pyrolysis chamber, a charging inlet and a gas outlet in the upper region thereof and a liquid outlet in the lower region thereof;

B. means for charging solid waste material having organic and inorganic components through said charging inlet;

C. gas-feed means for charging an oxygen-rich gas into said chamber under pressure at a plurality of vertically spaced points along the length thereof so as to produce combustion of the waste organic components and gnerate heat, said gas-feed means including a substantial'y vertical coaxial core member within said chamber to receive the oxygen-rich gas, said core member having ports adjacent said plurality of vertically spaced points for charging of the oxygen-rich gas therethrough said gas-feed means further including conduit means communicating between said core member and a source of oxygen-rich gas for supplying oxygen-rich gas under pressure to said plurality of vertically spaced points; and

D. means for controlling the charges of the oxygen-rich gas at each of said plurality of vertically spaced points to maintain a plurality of different temperature zones along the length of said chamber so as to effect incomplete combustion of the waste organic component and form a combustible gas and an organic-free molten refractory material whereby the combustible gas is removed through said gas outlet and the molten refractory material is removed through said solids outlet, said control means including plurality of vertically spaced thermal sensors, said control means being responsive to temperatures sensed by said thermal sensors for controlling the oxygen-rich gas being charged at each of said plurality of vertically spaced points:

E. and means for preheating the oxygen rich gas at said source of oxygen rich gas prior to passage into said conduit.

3,926,583

PROCESS FOR THE CATALYTIC STEAM REFORMING OF HYDROCARBONS

Jens Richard Rostrup-Nielsen, Copenhagen, Denmark, assignor to Haldor Topsoe A/S, Soborg, Denmark

Division of Ser. No. 81,534, Oct. 16, 1970, Pat. No. 3,791,993, which is a continuation of Ser. No. 734,232, June 4, 1968, abandoned. This application Nov. 8, 1973, Ser. No. 413,961
Claims priority, application United Kingdom, June 12, 1967, 27066/67The portion of the term of this patent subsequent to Feb. 12, 1991, has been disclaimed.
Int. Cl.² C01B *2/14*
U.S. Cl. 48—214 **6 Claims**

1. A process for the catalytic steam reforming of hydrocarbons in the gaseous phase in a reactor at elevated temperatures and pressures which comprises using a catalyst made by the process comprising the sequential steps of:

a. preparing a first aqueous solution of a soluble salt of a metal selected from the group consisting of nickel, iron and cobalt, said solution further containing a substance selected from the group consisting of soluble salts of magnesium and dispersed, finely divided, reactive magnesium oxide;

b. preparing a second aqueous solution containing a member selected from the group consisting of sodium aluminate and potassium aluminate and also containing an excess of base not chemically combined in the aluminate;

c. mixing said first aqueous solution with said second aqueous solution to cause simultaneous and differential coprecipitation of a fine sludge of intimately mixed fine particles of aluminum hydroxide, a hydroxide of an element selected from the group consisting of nickel, iron and cobalt, and a member of the group consisting of magnesium hydroxide and magnesium oxide;

d. washing said sludge substantially free from sodium and potassium in any form;

e. drying and dehydrating said sludge at a temperature of 300°–750°C. to form an intimate mixture of oxides of magnesium, aluminum and of an element selected from the group consisting of nickel, iron and cobalt;

f. calcining said mixture at a temperature of 850°–1100°C.;

g. wherein the starting materials are used in proportions so as to give the oxides mixture prior to calcination a content of 5–50 percent of an oxide selected from the class consisting of nickel, iron and cobalt oxides, 10–75 percent of magnesium oxide and 5–60 percent of aluminum oxide, the percentages being calculated on the total weight of the said compounds; and then

h. reducing at least part of the oxide of the metal selected from the group consisting of nickel, iron and cobalt to the corresponding free metal.

3,926,584

CATALYST AND CATALYTIC PROCESS

John Robert Adsetts, Norton, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 22, 1974, Ser. No. 463,141

Claims priority, application United Kingdom, Apr. 30, 1973, 20420/73

Int. Cl.² C01B 2/14

U.S. Cl. 48—214 3 Claims

1. A process for the reaction at temperatures in the range 200°–650°C of steam with a feedstock containing at least one hydrocarbon having a higher molecular weight than methane or is methanol comprising reacting said steam and feedstock in the presence of a catalyst, said catalyst being the product of reducing a precursor composition consisting essentially of a nickel compound in a proportion in the range 25–90 percent by weight calculated as nickel oxide NiO, alumina, an alkaline earth metal compound in a proportion in the range 0.1 to 10 percent by weight calculated as equivalent magnesium oxide, and an alkali metal compound in a proportion in the range 0.05 to 3.5 percent calculated as equivalent potassium oxide K_2O, the nickel oxide and alumina having been brought together by co-precipitation of water-insoluble compounds of nickel and aluminum with said alkaline earth compound, the space velocity being low enough to permit the methane forming reaction of hydrogen with carbon oxides or feedstock to proceed near equilibrium so as to produce a gas containing 50–70 percent of methane after removal of excess steam.

3,926,585

ABRASIVE SHEET CONTAINING A GRAIN-SIZE BINDER WITH WAX PARTICLES

Heinz Lukowski, Wesseling, Germany, assignor to Feldmuhle Anlagen- und Produktions- gesellschaft mit beschrankter Haftung, Duesseldorf-Oberkassel, Germany

Filed Mar. 4, 1974, Ser. No. 447,789

Claims priority, application Germany, Mar. 10, 1973, 2312052

Int. Cl.² B24D 11/02; C08J 5/14

U.S. Cl. 51—295 9 Claims

1. In a grinding or polishing material having a flexible base of sheet material, a layer of a first binder material on one of the major faces of said base, and a multiplicity of abrasive grains secured by said binder material to said base, the improvement which comprises a covering layer covering said grains and said first binder material and essentially consisting of an intimate mixture of a second binder material and a wax, said wax being present in said mixture in the form of particles having an average size of less than 500 microns, said second binder material being solid and shape-retaining at 25°C when traveling at 10,000 ft./min. in a circular arc of 4 inch diameter, the weight ratio of said second binder material to said wax in said mixture being between 1:5 and 2:1, said second binder material securing said particles to said grains, said first binder material, and said base, said binder materials being members of the group consisting of phenol formaldehyde resin, urea formaldehyde resin, epoxy resin, polyester resin, polyurethane resin, alkyd resin, and water soluble glue.

3,926,586

METHOD AND APPARATUS FOR COOLING A GAS WITH WATER DROPLETS

Sigvard Matts, Vaxjo, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Dec. 21, 1973, Ser. No. 427,060

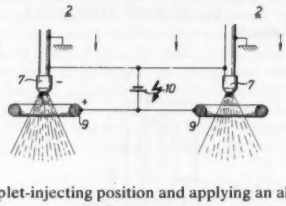
Int. Cl.² B03C 3/16

U.S. Cl. 55—10 9 Claims

1. In a method for cooling a hot gas as it flows along a path extending from a gas inlet of a generally-vertical cooling chamber to a gas outlet thereof spaced downstream of said gas inlet, by injecting droplets of coolant water into the gas in said chamber at a position adjacent said gas inlet, the gas being cooled by the resultant heating and vaporization of the water droplets in said chamber, the improvement comprising the steps of

electrically charging said droplets with a single common polarity of electrical charge; and

inducing a repetitive back-and-forth component of motion of said charged droplets in said chamber without producing substantial precipitation of them, by providing first and second spaced-apart electrode means extending along respective substantially-parallel planes on opposite sides of said gas-flow path in said chamber downstream of



said droplet-injecting position and applying an alternating voltage between said first and second electrode means alternately to attract and repel said charged droplets, the frequency of said alternating voltage being sufficiently high that for most of said droplets said component of motion is repetitively reversed and said droplets vaporized before they are deflected sufficiently to be precipitated by striking any of said electrode means;

whereby the speed of motion of said droplets with respect to said gas is increased and the rate of cooling of said gas by said charged droplets thereby accelerated.

3,926,587

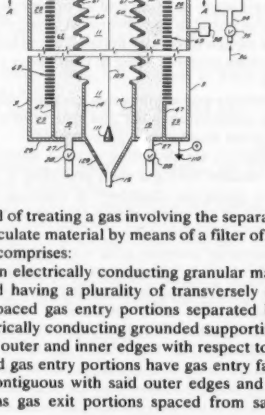
ELECTROSTATIC FILTRATION IN PANEL BED

Arthur M. Squires, 245 W. 104 St., New York, N.Y. 10025

Filed Sept. 19, 1974, Ser. No. 507,387

Int. Cl.² B03C 3/12

U.S. Cl. 55—12 16 Claims



1. The method of treating a gas involving the separation and removal of particulate material by means of a filter of granular material which comprises:

a. arranging an electrically conducting granular material in a panel bed having a plurality of transversely disposed upwardly spaced gas entry portions separated by interposed electrically conducting grounded supporting members having outer and inner edges with respect to the bed wherein said gas entry portions have gas entry faces substantially contiguous with said outer edges and wherein said bed has gas exit portions spaced from said inner edges;

b. producing a corona discharge of electricity outside of

said panel bed and in proximity to said gas entry portions;

c. forwardly flowing gas to be treated in a substantially continuing flow during its treatment in proximity to said corona discharge of electricity to charge electrically the particulate material in the gas and thereby to create a force of attraction between said particulate material and said granular material, and forwardly flowing the gas through said gas entry portions of the granular material bed and outwardly from the gas exit portions to separate anad accumulate particulate material at said gas entry faces;

d. stopping the flow of said gas;

e. causing a transient flow of gas to move in the direction in reverse to the flow of said gas in (c);

f. said transient reverse flow producing first a rise at a given rate of rise and subsequently a fall in the pressure difference between said gas exit portions and said gas entry portions, said difference produced by said transient reverse flow remaining greater than a first critical minimum difference for a time interval less than about 150 milliseconds, said first critical difference being that difference at which a steady flow of gas in said reverse direction just produces a localized spill of granular material from said gas entry faces, and said difference produced by said transient reverse flow peaking to a top value beyond a second critical minimum difference, which is the pressure difference at which a transient flow of gas in said reverse direction producing said pressure difference at said rate of rise just initiates a body movement of the granular material toward said gas entry faces to spill a portion of the granular material from the bed.

3,926,588

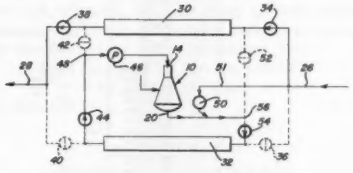
PRESSURIZED GAS TRANSFER SYSTEM

Richard E. Speece, 4516 Verplanck Place, N.W., Washington, D.C. 20016

Filed Nov. 28, 1973, Ser. No. 419,493

Int. Cl.² B01D *19/00*; **C02B** *1/34*

U.S. Cl. 55—52 **20 Claims**



1. In combination with a gas transfer device for introducing a gas into a relatively incompressible fluent material conducted between inlet and outlet conduits, a low energy fluid pressurizing system including flow chamber means, flow circulating means for recirculating a body of the fluent material through a closed loop between the gas transfer device and said chamber means, conduit means for conducting flow of the fluent material under a predetermined pressure head between said inlet and outlet conduits through said chamber means independently of said closed loop, flow control valve means connected to the conduit means and the flow circulating means for separately establishing said recirculation in the closed loop through the chamber means and said flow through the chamber means between the inlet and outlet conduits to respectively gasify the fluent material accumulated in the chamber means and to permit displacement of the gasified fluent material from the chamber means, and valve operating means connected to the flow control valve means for alternating said recirculation of the fluent material through the chamber means and said displacement of the gasified fluent material from the chamber means.

3,926,589

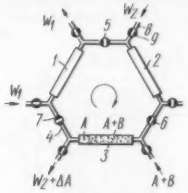
DEVICE AND METHOD FOR SEPARATION OF FLUID MIXTURE INTO FRACTIONS IN A CHROMATOGRAPH

Toe Jokhannesovich Klementi, ulitsa Pukhkekodu tee, 46, kv. 1; Henn-Jaak Eerovich Herem, ulitsa Ekhte, 3, kv. 14, both of Tallin, and Eduard Petrovich Skornyakov, Kronshtadsky bulvar, 49, kv. 66, Moscow, all of U.S.S.R.

Filed Dec. 21, 1973, Ser. No. 427,409

Int. Cl.² B01D *15/08*

U.S. Cl. 55—67 **1 Claim**



1. A method of chromatographic separation using at least three chromatographic separating columns connected in a circulation loop, each column during a plurality of cycles successively acting as an enriching column as a stripping column and as a regenerating column, the steps for each cycle comprising: continuously introducing the mixture to be separated at constant flow rate into a pipe for connecting the stripping column to the enriching column; recovering a fraction of the mixture enriched in more strongly adsorbed components at the outlet of the regenerating column; recovering a fraction of the mixture enriched in less strongly adsorbed components at the outlet of the enriching column, the separation and recovering of the fraction enriched in less strongly adsorbed components being carried out by means of a first carrier gas stream, the recovering of the fraction enriched in more strongly adsorbed components and regeneration of the separating column being carried out by means of second carrier gas stream; shifting of the inlet point of the mixture and the inlet and outlet points of the carrier gas streams along the columns in the direction of gas flow periodically and simultaneously, each time the inlet of the separating column previously regenerated being connected to the outlet of the separating column into which formerly the mixture was introduced, the duration of the cycle between two successive shiftings of gas streams, the introducing rate of the mixture to be separated and carrier gas flow rate into the stripping column being related so that at the moment of the subsequent shifting of gas streams when more adsorbed components to be removed from the outlet of a regenerating column have reached the outlet of the enriching column less adsorbed components to be removed from the outlet of an enriching column have already left the stripping column wholly entering the enriching column.

3,926,590

PROCESS FOR TREATMENT OF WASTE GASES

Toshio Aibe; Seiji Mochida, both of Osaka, and Kiyoshi Itoga, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Oct. 17, 1973, Ser. No. 407,287

Claims priority, application Japan, Oct. 24, 1972, 47-106473

Int. Cl.² B01D *53/04*

U.S. Cl. 55—68 **7 Claims**

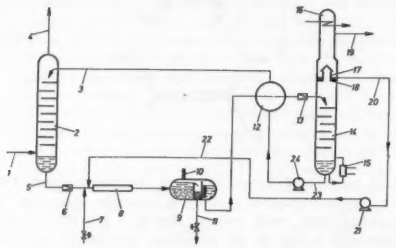
1. A process of treating waste gas which comprises contacting a modified activated carbon which is prepared by contacting activated carbon with gaseous ammonia at 300° to 1,300°C, with a waste gas containing sulfur oxide and/or nitrogen oxide at room temperature to 200°C to remove the sulfur oxide and/or nitrogen oxide from the said waste gas.

3,926,591

REGENERATION OF SCRUBBING AGENT USED FOR THE REMOVAL OF CO_2 AND H_2S FROM GASES CONTAINING POLYMERIZABLE HYDROCARBONS

Alfred Wildmoser, Haar, and Erich Dannhorn, Munich, both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Dec. 6, 1973, Ser. No. 422,562
Claims priority, application Germany, Dec. 6, 1972, 2259803
Int. Cl.[2] B01D *50/00, 53/14*
U.S. Cl. 55—68 7 Claims



1. In a process for the purification of gas containing a major portion of hydrocarbon, a thermally polymerizable diolefin and at least one acidic component selected from the group consisting of carbon dioxide and hydrogen sulfide, which process comprises:

a. scrubbing said gas with normally liquid, alkaline, heat-regenerated scrubbing means capable of removing the acidic component and dissolving at least a portion of said polymerizable diolefin to form loaded scrubbing means containing said acidic component and said polymerizable diolefin;

b. contacting said loaded scrubbing means with liquid hydrocarbon solvent to extract out a major quantity, but less than 100% of said thermally polymerizable diolefin, and separating resultant loaded hydrocarbon solvent from resultant hydrocarbon treated loaded scrubbing means; and

c. thermally regenerating said resultant hydrocarbon treated loaded scrubbing means in a regenerating column to form a gaseous overhead containing said at least one acidic component and residual thermally polymerizable diolefin, and a bottoms of regenerated scrubbing means, the improvement wherein said gaseous overhead is cooled to form a condensate containing said residual thermally polymerizable diolefin, and preventing resultant condensate from being refluxed into said regenerating column thereby mitigating the extent of polymerization of said thermally polymerizable diolefin within said regeneration column and wherein said condensate is recycled to the loaded scrubbing means immediately prior to the contacting thereof with said hydrocarbon solvent.

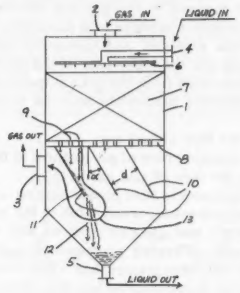
3,926,592

ENTRAINMENT SEPARATOR IN CO-CURRENT FLOW

Max Leva, 10 Hodgson Ave., Pittsburgh, Pa. 15205

Filed Sept. 3, 1974, Ser. No. 502,786
Int. Cl.[2] B01D *47/00*
U.S. Cl. 55—84 14 Claims

1. The method of separating entrained liquids from gases, comprising introducing separate streams of liquid and gas at the top portion of a tower, forming the liquid into a dispersed state entrained by gas, passing the gas and entrained liquid through a contacting zone, allowing the gas and entrained liquid to leave the contact zone and allowing the combined streams of gas and entrained liquid to be directed towards slanted baffle plates disposed below said contacting zone, causing the dispersed liquid to wet said baffle plates, thus forming a liquid layer on top of said baffle plates which runs downwardly toward the lower edge of said baffle plates and



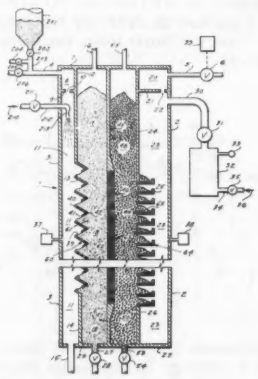
empties into a sump of the tower, to form at least one concentrated liquid stream, and diverting the gas now substantially freed of liquid around said lower edge and away from said baffle plates and out of said tower.

3,926,593

PRECOATING PANEL BED FOR FILTERING AEROSOL OF MICRON-SIZE PARTICULATES

Arthur M. Squires, New York, and Kun-Chieh Lee, Bronx, both of N.Y., assignors to Arthur M. Squires, New York, N.Y.

Filed Sept. 19, 1974, Ser. No. 507,403
Int. Cl.[2] B01D *46/04*
U.S. Cl. 55—96 43 Claims



10. The method of treating a gas including the separation and removal of micron-size particulate matter by means of a filter of granular material which comprises:

a. arranging granular material in a panel bed having a plurality of transversely disposed upwardly spaced gas entry portions separated by interposed supporting members having outer and inner edges with respect to the bed wherein said gas entry portions have gas entry faces substantially contiguous with said outer edges and wherein said bed has gas exit portions spaced from said inner edges;

b. forwardly flowing gas through the gas entry portions of the granular material bed and outwardly from the gas exit portions while adding to said gas a element selected from the group consisting of granular or fibrous medium substantially smaller than about 120 mesh to separate and accumulate said medium in surface layer deposits at said

gas entry faces wherein said gas enters said gas entry faces at a velocity greater than about 16 feet per minute during at least a part of this step (b);

c. thereafter causing a transient flow of gas to move in the direction in reverse to the flow of said gas in (b);

d. said transient reverse flow producing first a rise at a given rate of rise and subsequently a fall in the pressure difference between said gas exit portions and said gas entry portions, said difference remaining greater than a first critical minimum difference for a time interval less than about 150 milliseconds, said first critical difference being that difference at which a steady flow of gas in said reverse direction just produces a localized spill of said granular material from said gas entry faces, and said difference produced by said transient reverse flow peaking to a top value beyond a second critical minimum difference, which is the pressure difference at which a transient flow of gas in said reverse direction producing said pressure difference at said rate of rise just initiates a body movement of said granular material toward said gas entry faces to spill a portion of the granular material from the bed;

e. supplying fresh granular material to replace material spilled from said gas entry portions;

f. repeating the cycle of said steps (b), (c), (d), and (e) at least two times and then repeating step (b);

g. forwardly flowing gas to be treated through the gas entry portions of the granular material bed and outwardly from the gas exit portions to treat said gas by contact with said surface layer deposits and thereby to separate and accumulate micron-size particulate matter on said surface layer deposits of said granular or fibrous medium and wherein either at least a first part of this step (g) occurs simultaneously with a said step (b), the gas in (b) comprising the gas to be treated, or this step (g) is wholly subsequent to said step (b); and

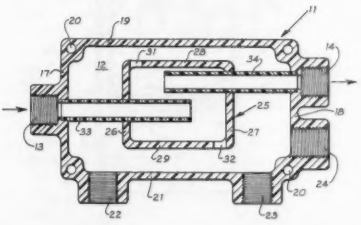
h. thereafter repeating steps (c) (d), (e), (b), and (g) in a cyclic manner.

3,926,594

WATER TRAP FOR PITOT STATIC SYSTEM

James N. Seib, Williams, Ind., and Harry G. Willis, Plainfield, Ill., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 6, 1975, Ser. No. 538,659
Int. Cl.² B01D *45/00*
U.S. Cl. 55—159 **4 Claims**



1. A water separator for a pitot static system comprising,

a first enclosed chamber having an inlet for receiving air and water from a pitot tube and an outlet for providing air to an instrumentation gauge,

a second enclosed chamber positioned within said first enclosed chamber,

a first tubular pipe connecting said inlet and said second enclosed chamber, and a second tubular pipe connecting said outlet and said second enclosed chamber, the axes of said first and second tubular pipes being displaced from one another with the ends of said pipes extending into said second enclosed chamber overlapping one another,

at least one drain opening in said second enclosed chamber for draining water from said second enclosed chamber into said first enclosed chamber, and

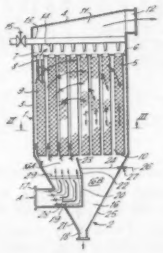
at least one drain opening in said first enclosed chamber for draining water from said first enclosed chamber.

3,926,595

DUST FILTER APPARATUS

Ole Kristian Bockman, Oslo, Norway, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Jan. 18, 1974, Ser. No. 434,420
Claims priority, application Norway, Jan. 22, 1973, 250/73
Int. Cl.² B01D *46/04, 51/00*
U.S. Cl. 55—302 **9 Claims**



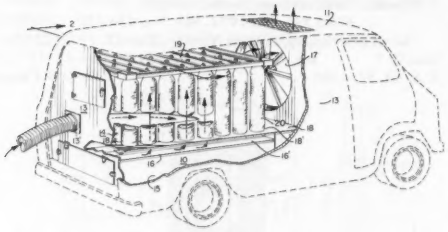
1. In appparatus for filtering raw gas containing fine particulate matter, and of the type comprising a filter chamber having a top wall, side walls and an open lower end and containing a set of filter bags substantially vertically suspended from said top wall and horizontally spaced apart by passages to permit free passage of said gas through said bag set on the outside of said bags in the vertical direction and in at least one horizontal direction within said chamber, said filter bags having openings at their upper ends and being closed at their lower ends substantially adjacent said open lower end of said filter chamber, at least one outlet chamber above said top wall and communicating with the interiors of said bags through openings in said top wall and through said upper-end openings for receiving gas filtered through the walls of said bags, means for reverse flushing said bags from the inside to separate deposited fine particulate matter from their exterior surfaces, at least one bottom chamber having side walls and arranged beneath said filter chamber and closing said open lower end of said filter chamber and having at least one inlet for said gas whereby a gas pressure difference applied between said gas inlet and said outlet chamber and having its lowermost pressure value at said outlet chamber will establish a flow of gas from said bottom chamber into said bags and therethrough to said outlet chamber, said bottom chamber having an outlet for particulate matter separated from said filter bags by said reverse flushing, the improvement comprising:

partition means separating said bottom chamber into at least one inlet compartment and at least one outlet compartment, said inlet compartment communicating with said gas inlet to establish an initial upward flow of said gas through the passages located substantially above said inlet compartment, said outlet compartment communicating with said particulate-matter outlet for receiving said separated fine particules, said inlet compartment communicating with said filter chamber through a limited portion of said open lower end of said filter chamber, said outlet compartment communicating with said filter chamber through a remaining portion of said open lower end of said filter chamber, whereby said initial upward flow of said gas from said inlet compartment progressively diverges laterally and then downwardly in said passages above said outlet compartment to carry said separated particulate matter from the passages above said inlet compartment into the passages above said outlet compartment, said partition means establishing substantially no flow conditions in said outlet compartment to allow said particulate matter to settle by gravity within said outlet compartment.

3,926,596
AGITATING BAG RACK AND BAFFLE STRUCTURE FOR FURNACE CLEANERS

Claude M. Coleman, 1001 S. 11th Ave., Yakima, Wash. 98902

Filed Sept. 26, 1974, Ser. No. 503,997
Int. Cl.² B01D *41/04*
U.S. Cl. 55—304 4 Claims



1. A mobile-vacuum-furnace cleaner, being mounted on a vehicle chassis having a sealed body, a fan and means for powering said fan, and a vacuum inlet mounted centrally in one of the side walls of said body, comprising:

a bag assembly comprising a bag platform having a horizontally disposed plate-like deck mounted horizontally in the lower portion of said body below said vacuum inlet, said bag platform having a multiplicity of tunnels and bag collars, a bag rack including a framework having means suspending said framework by springs from said body, and vacuum bags being mounted at their tops to said bag rack framework, and with their mouths mounted at said bag collars; and

a baffle assembly comprising a multiplicity of plates being mounted on pivots which are aligned with the horizontal plane to said body, said plates being juxtaposed at intervals permitting said plates, when oriented with their width dimensions aligned, to form a floor distally below said bag platform, and below said vacuum inlet, said baffles having downwardly disposed capstans being pivotally connected to a connector rod having means for actuating said rod to pivot said plates on said pivots.

3,926,597
CABINET FOR BIOHAZARDOUS MATERIALS

Jerome J. Landy, 13700 SW. 78th Court, Miami, Fla. 33131

Filed Jan. 26, 1973, Ser. No. 326,608
Int. Cl.² B08B *15/02*
U.S. Cl. 55—338 10 Claims

1. A cabinet for biohazardous materials having a rectangular housing comprising, in combination,

vertical tube defining a portion of said cabinet,

a blower mounted interiorly of said housing,

a plenum chamber in open communication with said blower for directing contaminated air upwardly in the rear portion of said tube,

a recirculating filter and an exhaust filter in airflow communication with said plenum chamber,

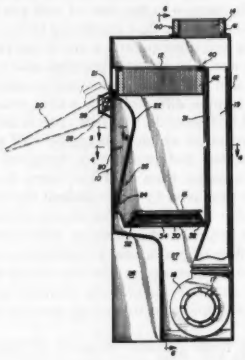
a work tray positioned in a midportion of said tube,

an opening having upper, lower, and side edges in said vertical tube the major portion of which is above the work tray,

a curvilinear viewing panel secured to said upper edge of the opening and depending downwardly and inwardly therefrom and thence forwardly thereby defining an airfoil recess with its deepest penetration in the upper half of said viewing panel,

said recirculating filter being positioned adjacent to and above said viewing panel,

a slot at the lower portion of said viewing panel permitting operator access to the work tray and for admitting make up air laterally spaced from said work tray, whereby interiorly recirculating laminar flow air passes over the viewing panel thereby further directing the makeup air

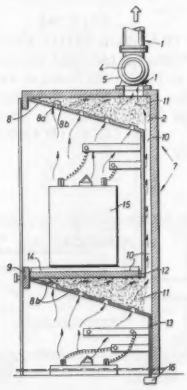


through the makeup air slot and inhibiting the outward flow of the contaminated air.

3,926,598
APPARATUS FOR SEPARATING, COLLECTING AND REMOVING SULPHURIC ACID FUMES AND THE LIKE FROM EVACUATION AIR

Björn G. O. Filén, Stockholm, Sweden, assignor to AB Essve Produkter, Stockholm, Sweden

Filed Oct. 24, 1974, Ser. No. 517,607
Claims priority, application Sweden, Nov. 5, 1973, 7314995
Int. Cl.² B01D *46/00*
U.S. Cl. 55—385 4 Claims

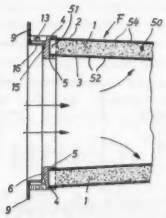


1. Apparatus for separating, collecting and removing sulphuric acid fumes from air evacuated from battery-charging cabinets, consisting of a closed container having a bottom surface, long, unbroken, sharp-edged turnings of polyvinyl chloride filling said container, duct means to cause the evacuation air having sulphuric acid fumes therein to flow turbulently through said container whereby the sharp edges of the turnings are impinged by the sulphuric acid fumes and cause these fumes to agglomerate and form drops on the surface of the turnings, means to collect and lead off the drops of sulphuric acid from the bottom surface of the container, and a receptacle for receiving the collected drops from said collection means.

3,926,599
FILTER CARTRIDGE

Ernst Rudin, Arboldswil, and Heinz Weisskopf, Oberrohrdorf, both of Switzerland, assignors to H. Gertsch & Co. Aktiengesellschaft, Zurich, Switzerland

Filed Jan. 25, 1974, Ser. No. 436,777
Claims priority, application Switzerland, Feb. 2, 1973, 1485/73; Sept. 14, 1973, 13232/73
Int. Cl.² B01D *53/04*
U.S. Cl. 55—387 **14 Claims**

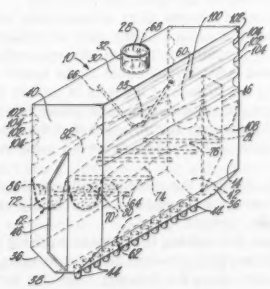


1. A filter cartridge comprising a hood-like frame having a mouth portion and a filler of adsorption material in the form of pourable material housed in the frame, said frame comprising an outer hood member and an inner hood member which is arranged within the outer hood member in spaced relationship therewith, the two hood members each having a perforated wall and the space defined between the two hood members containing said adsorption material in the form of a substantially hood-like shell, and said hood-like frame having hood edge means located at the region of the mouth portion.

3,926,600
GLASS FIBER STREAM FEEDER

Charles J. Stalego, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 28, 1974, Ser. No. 474,114
Int. Cl.² C03B *37/02*
U.S. Cl. 65—1 **17 Claims**



1. A feeder for supplying molten glass streams in producing glass filaments comprising:

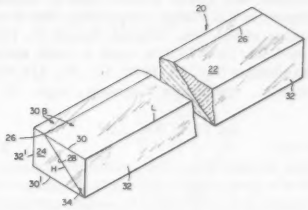
a bottom wall having openings through which molten glass in the feeder is discharged as streams for attenuation into glass filaments, joined together opposed walls extending generally normally away from the bottom wall, at least one of the walls having a corrugated region to provide an increased surface area in such region for heat transfer; and

means for heating the feeder.

3,926,601
METHOD FOR MAKING GLASS BLADES

John Wilbur Hicks, Jr., Apple Hill Road, Sturbridge, Mass. 01566

Division of Ser. No. 224,533, Feb. 8, 1972, Pat. No. 3,831,466.
This application June 10, 1974, Ser. No. 478,053
Int. Cl.² C03C *15/00, 23/20*
U.S. Cl. 65—31 **9 Claims**



1. The method of producing glass blades comprising the steps of

a. forming a first vitreous material resistant to chemical etching with a sharp edge configuration, said material being of a cross-section having a perimeter with first and second sides intersecting at an acute angle to form said sharp edge configuration,

b. forming a combination glass blank comprising

1. said first vitreous material and
2. a second vitreous material susceptible to chemical etching including a perimeter, part of which is in contact with at least a portion of one of said sides of said sharp edge configuration of said first material,

c. heating such combination blank to a temperature corresponding to the softening points of the vitreous materials and sufficient to draw and attenuate same,

d. drawing the heated combination blank and attenuating the same down to a desired size while protecting the sharp edge configuration by means of said contact,

e. then removing the second vitreous material from the drawn and attenuated combination blank by means of a chemical etching process to which the second material is susceptible and to which the first material is resistant.

3,926,602
GLASS-CERAMIC ARTICLES WITH REFLECTIVE SURFACES

Ronald L. Andrus, Elmira, and Richard F. Reade, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed June 19, 1974, Ser. No. 480,961
Int. Cl.² C03B *32/00;* **G02B** *5/20*
U.S. Cl. 65—33 **7 Claims**

1. A method for making a glass-ceramic article composed of a body portion and a highly-durable, integral surface layer exhibiting a reflective, metallic luster, said body portion consisting essentially of beta-quartz solid solution crystals dispersed within a glassy matrix and said integral surface layer consisting essentially of hematite (alpha-Fe_2O_3) crystals dispersed within a glassy matrix, comprising the steps of:

a. melting a batch for a glass consisting essentially, in weight percent on the oxide basis, of about 0.5–3.5% FeO, 3–6% Li_2O, 16–21% Al_2O_3, 65–75% SiO_2, and 1.5–7% RO_2, wherein RO_2 consists of 1.5–6% TiO_2 and 0–3% ZrO_2;

b. simultaneously cooling the melt to at least within the transformation range and forming a glass article of a desired configuration therefrom;

c. exposing said glass article to a temperature between about 850°–1025°C. for a period of time sufficient to cause the growth of beta-quartz solid solution crystals in situ in said

body portion and the growth of hematite (alpha-Fe_2O_3) crystals in situ in said surface layer; and

d. cooling to room temperature.

3,926,603

METHOD OF MANUFACTURING A GLASS CERAMIC MATERIAL WHICH IS RESISTANT TO SODIUM VAPOUR

Gertraud Agnes Anna Plesslinger, Eindhoven, Netherlands; Frank Berthold, and Erwin Roeder, both of Aachen, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. Nos. 340,218, March 12, 1973, abandoned, and Ser. No. 813,029, April 3, 1969, abandoned. This application Nov. 18, 1974, Ser. No. 524,703

Claims priority, application Germany, Apr. 10, 1968, 1771143

Int. Cl.² C03C *3/22*

U.S. Cl. 65—33 **2 Claims**

1. A method for manufacturing a translucent glass ceramic body shaped of a glass produced by melting a mixture consisting of a composition in percentage by weight calculated as an oxide within ranges

CaO	30 - 50
Al_2O_3	35 - 55
MgO	2 - 7
BaO	4 - 16
Y_2O_3	0 - 10
B_2O_3	3 - 9
ZrO_2	0 - 10

comprising devitrifying said glass body by heating it at temperatures between 700° and 900°C for time periods between 30 and 120 minutes to form 3 $CaO.B_2O_3$ nuclei; then heating said body to a temperature between 900° and 1000°C and maintaining said temperature between 900° and 1000°C for a time period of 30 to 120 minutes, then heating said body to a temperature between 1000° and 1200°C and maintaining said temperature between 1000° and 1200°C for a time period between 60 and 240 minutes to crystallize $CaO.Al_2O_3$ compound on said nuclei, said compound having a high resistance to the action of sodium vapor at high temperatures, and finally cooling said body.

3,926,604

METHOD FOR APPLYING AN INORGANIC TITANIUM COATING TO A GLASS SURFACE

Gary Lynn Smay, Butler; Ronald Van Caporali, West Sunbury, and Russell Duty Southwick, Butler, all of Pa., assignors to Glass Container Manufacturers Institute, Inc., Washington, D.C.

Filed Feb. 19, 1974, Ser. No. 443,227

Int. Cl.² C03C *17/22*; **B05D** *1/36, 3/02, 1/02*

U.S. Cl. 65—60 **8 Claims**

1. In a method for applying an in-organic titanium-containing coating to a glass surface comprising exposing said surface to a thermally-decomposable titanium compound at an elevated temperature sufficient to cause thermal decomposition of said compound to form said coating, the improvement wherein said coating is formed by spraying onto said surface a finely divided dilute aqueous solution of a titanium oxychloride of the formula $Ti(OH)_xCl_{(4-x)}$, wherein x is 1, 2, or 3, said temperature ranging from about 300°F. to about 800°F.

4. In a method for imparting improved scratch resistance and lubricity to a glass container comprising applying an inorganic titanium-containing coating and a lubricous organic coating to the outer surface of said container, said titanium-containing coating being formed by applying a thermally-decomposable compound to the surface of said container at an elevated temperature sufficient to cause thermal decomposition of said compound to form said coating, the improvement wherein said inorganic coating is formed by spraying a finely divided dilute aqueous solution of a titanium oxychloride of the formula $Ti(OH)_xCl_{(4-x)}$, wherein x is 1, 2 or 3, onto said container, said temperature ranging from about 300°F. to about 800°F.

3,926,605

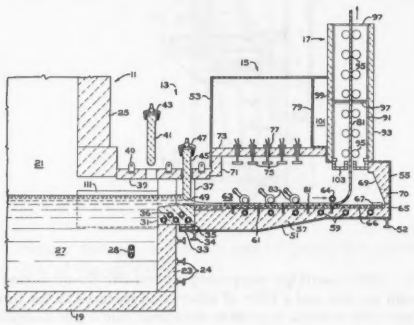
METHOD AND APPARATUS FOR FORMING A RIBBON OF GLASS ON A MOLTEN METAL BATH

Gerald E. Kunkle, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 27, 1974, Ser. No. 483,508

Int. Cl.² C03B *18/02*

U.S. Cl. 65—65 A **29 Claims**



1. A method of making a sheet of glass comprising the steps of

a. delivering a layer of molten glass onto the surface of a pool of molten metal along a substantially horizontal path and maintaining the surface of the pool of molten metal at substantially the elevation of glass delivery;

b. advancing the glass along the surface of the pool of molten metal while cooling it and applying forces to it to advance it and to form a continuous sheet of glass, wherein said cooling is adjusted and maintained at a plurality of discrete locations along the path of advance of the glass such that the temperature of the advancing glass is progressively decreased sufficiently to cause the glass, while yet advancing along the surface of the pool of molten metal, to be sufficiently viscous to maintain dimensional stability of its width and thickness;

c. lifting the cooled viscous glass substantially vertically upwardly from the surface of the pool of molten metal and conveying it substantially vertically upwardly therefrom at a speed substantially equal to the speed of glass advance along the surface of the pool of molten metal in a region where the advancing glass is sufficiently viscous to maintain dimensional stability such that the lifted glass retains the width and thickness achieved prior to lifting; and

d. progressively cooling the dimensionally stable sheet of glass while conveying it substantially vertically upwardly at substantially constant speed.

26. An apparatus for making flat glass comprising a glass-making furnace for supplying molten glass for forming, means for delivering molten glass for forming from the furnace, a glass forming chamber for forming a continuous sheet of glass connected to the glassmaking furnace through the molten glass delivery means; and means for lifting and conveying a formed continuous sheet of glass upwardly from the forming chamber; wherein

said forming chamber comprises an enclosed chamber having in its upper portion a space for containing a protective non-oxidizing atmosphere and having in its bottom portion a pool of molten metal for supporting glass during forming, the pool of molten metal having an upper glass-supporting surface at substantially the same elevation as a glass supporting member of said molten glass delivery

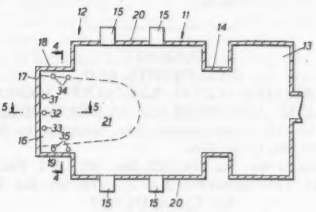
means; means for advancing the glass along the surface of the pool of molten metal and a plurality of edge rolls for applying sufficient outward transverse forces to the glass during its advance to cause it to develop a desired width and thickness; means for adjusting and maintaining the temperature of the advancing glass at a plurality of locations along its path of advance, said means being suited to cool the glass to a temperature at which it is sufficiently viscous to maintain the developed width and thickness as dimensionally stable width and thickness and means for cooling the continuous sheet of glass sufficiently substantially immediately prior to lifting to maintain it sufficiently viscous during lifting so that its dimensional stability is maintained as it is lifted; and wherein

said glass conveying means comprises means for conveying the continuous sheet of glass substantially vertically upwardly at the speed of glass advance substantially immediately prior to lifting; and means for uniformly cooling the glass to its annealing point while conveying it upwardly.

3,926,606
GLASS MELTING TANK

Donald Charlesworth, Northwich, England, assignor to Pilkington Brothers Limited, Lancashire, England

Filed July 2, 1974, Ser. No. 485,143
Claims priority, application United Kingdom, July 4, 1973, 31866/73
Int. Cl.² C03B 3/00
U.S. Cl. 65—135 **9 Claims**



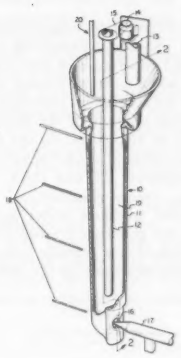
1. A glass melting tank comprising an elongated tank body for containing molten glass, said tank having a feeding end with a filling pocket for receiving the glass forming material, said pocket being adjacent an end wall of the tank and of less width than the body of the tank, said filling pocket being generally centrally located transversely of the tank and being operable to establish a blanket of batch material extending forwardly on the molten glass, and auxiliary heating means at the filling end, which auxiliary heating means comprises at least three heating electrodes located within said filling pocket, and means for selectively controlling passage of heating current between different pairs of electrodes to control the lateral position of said forwardly extending blanket.

7. A method of melting glass forming material which method comprises feeding batch material into a filling pocket at one end of a glass melting tank, applying heat to the material within the tank to form molten glass while retaining a blanket of unmolten material on the surface of the glass at said one end of the tank extending forwardly of said filling pocket on the molten glass, and controlling the lateral position of said forwardly extending blanket within the tank by applying selectively localised heat in the filling pocket below the blanket.

3,926,607
METHOD FOR REFINING MOLTEN GLASS-MAKING MATERIALS

Fred G. Pellett, Maumee, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 439,604, Feb. 4, 1974, abandoned.
This application Feb. 10, 1975, Ser. No. 548,414
Int. Cl.² C03B 5/18
U.S. Cl. 65—136 **2 Claims**



1. A method of refining molten glassmaking materials comprising the steps of: forming a passage between a cylindrically shaped surface and a tubular stirring device of about the same length as the cylindrically shaped surface; introducing molten glass containing gaseous inclusions into the passage and downwardly passing the molten glass between the tubular surfaces; rotating at least one of the cylindrical surfaces at a speed of between 30 and 810 revolutions per minute; maintaining the glass temperature between 2550°F and 2700°F; controlling the residence time of molten glass in the annulus to an equivalent flow rate between 60 and 150 grams of molten glass per hour and thereby causing gaseous inclusions to coalesce and to flow upwardly in a direction opposite to the downward flow of molten glass-forming material in the passage; and discharging molten glass having a controlled number of gaseous inclusions.

3,926,608
COMPOSITIONS FOR SOIL IMPROVEMENT AND PROCESS FOR THEIR PRODUCTION

Luigi Piccolo, and Antonio Paolinelli, both of Milan, Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Mar. 8, 1974, Ser. No. 449,565
Claims priority, application Italy, Mar. 8, 1973, 21319/73
Int. Cl.² A01N 7/02
U.S. Cl. 71—1 **5 Claims**

2. A process for preparing soil-improving compositions characterized in that an ammonium iron alum solution in a concentration of 30 to 55 percent by weight is sprayed on foamed polystyrene particles, the temperature being kept at between 100° and 125°C, said polystyrene particles having a particles size of 0.01 to 3 mm and an apparent density of 8 to 30 kg/m³, the weight ratio of ammonium iron alum to the polystyrene particles being in the range of 3:1 to 30:1.

3,926,609

GRANULAR MGO-CONTAINING POTASSIUM SALT FERTILIZERS AND PROCESS FOR THEIR MANUFACTURE

Alexander Effmert, Hannover, and Ulrich Neitzel, Heringen, both of Germany, assignors to Kali und Salz Aktiengesellschaft, Kassel, Germany

Filed Apr. 18, 1974, Ser. No. 462,088
Int. Cl.² C05D 9/02
U.S. Cl. 71—31 **14 Claims**

1. A process for manufacturing granulated MgO-containing fertilizers based on potassium chloride or sulfate salts, and having a high abrasion resistance and high compression resistance comprising

1. mixing dry, hot technical potassium chloride or sulfate or mixture thereof, recycled material with a hot, moist langbeinite having a temperature of between approximately 75° and 100°C. and a moisture content of approximately 15 to 25% with the addition of sufficient water, to adjust the total moisture content of the mixture to between approximately 3 to 10% based on the dry components, said mixing being effected at a temperature of the mixture between approximately 75° and 110°C. under constant agitation to form a moist granulate,
2. cooling the moist granulate under agitation to below 60°C., whereby the granulate is solidified,
3. removing the desired size granular material and
4. recycling the finer size material into the mixing step.

3,926,610

REMOVAL OF FERTILIZER PRECIPITATE

Joseph R. Kenton, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 10, 1974, Ser. No. 477,992
Int. Cl.² C05B 1/00
U.S. Cl. 71—34 **3 Claims**

1. A process for treating the slurry precipitate of a liquid fertilizer consisting essentially of an aqueous solution of ammonium polyphosphate containing 10 weight percent of nitrogen, 34 weight percent of P_2O_5 and no potash, said process comprising

a. mixing said slurry precipitate with an acid selected from the group consisting of the acids of phosphorus and nitric acid,
b. adjusting the quantity of acid employed with respect to the quantity of liquid precipitate employed so that a solution having a pH of 3 is obtained,
c. neutralizing said solution by the addition of ammonia to a pH in the range of about 5 to about 6.6.

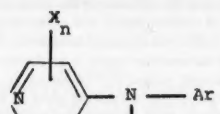
3,926,611

4-ARYLAMINOPYRIDINE HERBICIDES

Clive Dudley Spencer Tomlin, Maidenhead; Charles Brian Barlow, Camberley, and Brian Graham White, Crowthorne, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 29, 1972, Ser. No. 230,514
Claims priority, application United Kingdom, Mar. 19, 1971, 7291/71
Int. Cl.² A01N 9/22
U.S. Cl. 71—94 **3 Claims**

1. A method of inhibiting the growth of unwanted vegetation, which comprises applying to the locus of the vegetation a herbicidally effective amoung of a 4-arylaminopyridine of the formula:



or a salt thereof, wherein R is hydrogen; Ar is phenyl, or substituted phenyl bearing a substituent selected from the group consisting of chlorine, bromine, fluorine, nitro, cyano, alkyl of 1–4 carbons and trifluoromethyl, X is selected from the group consisting of chlorine, bromine and fluorine; and *n* is 3 or 4.

3,926,612

HERBICIDAL COMPOSITION CONTAINING S-(2-CHLOROBENZYL)-N,N-DI-ISOPROPYLTHIOCARBAMATE

Makoto Konnai, Shizuoka; Hiroshi Kamata, and Masaru Kado, both of Shimizu, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 70,502, Sept. 8, 1970, Pat. No. 3,822,124, Continuation of Ser. No. 868,900, Oct. 23, 1969, abandoned, which is a continuation-in-part of Ser. No. 651,148, July 5, 1967, Pat. No. 3,582,314. This application Apr. 22, 1974, Ser. No. 462,933The portion of the term of this patent subsequent to June 1, 1988, has been disclaimed.
Int. Cl.² A01N 9/12
U.S. Cl. 71—100 **1 Claim**

1. A method of selectively killing undesirable weeds in lawn by spreading thereon a herbicidally effective amount of S-(2-chlorobenzyl)-N,N-di-isopropylthiocarbamate, in combination with an inert diluent.

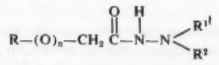
3,926,613

1-(NAPHTHYL AND NAPHTHYLOXY-ACETYL-2,2-DIALKYL HYDRAZINE ACIDS AND THEIR USE AS HERBICIDES

Gerhard H. Alt, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 214,382, Dec. 30, 1971, Pat. No. 3,767,623. This application July 2, 1973, Ser. No. 375,397
Int. Cl.² A01N 9/20
U.S. Cl. 71—118 **6 Claims**

1. Herbicidal composition comprising an inert carrier and a herbicidally effective amount of a compound of the formula



wherein R is a naphthyl group, R^1 and R^2 are each independently an alkyl group of from 1 to 6 carbon atoms and *n* is 0 or 1.

3,926,614

ILMENITE BENEFICIATION WITH $FeCl_3$

Hans Hellmut Glaeser, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Apr. 19, 1974, Ser. No. 462,535
Int. Cl.² C21B 1/00; C01G 49/02
U.S. Cl. 75—1 **14 Claims**

1. Cyclic process for selectively chlorinating the iron constituent of titaniferous material comprising passing an oxidizing agent to a first reaction zone, said first reaction zone containing ferrous chloride, thereby oxidizing the ferrous chloride to ferric chloride, the temperature in said first reaction zone being maintained above the boiling point of ferric chloride, passing said ferric chloride to a second reaction

zone, said second reaction zone containing said titaniferous material and a reductant, said reductant being selected from at least one of the group consisting of solid carbonaceous material and gaseous carbon monoxide, the amount of carbon in said solid carbonaceous material being greater than the stoichiometric amount for conversion of the oxygen bound to said iron constituent to carbon dioxide and less than or about equal to the stoichiometric amount for conversion of said oxygen to carbon monoxide, the amount of said gaseous carbon monoxide being at least sufficient to convert the balance of said oxygen to carbon dioxide, the temperature in said second reaction zone being at least 950°C., thereby chlorinating the iron constituent in said titaniferous material to form ferrous chloride, and recycling ferrous chloride to said first reaction zone.

3,926,615

PRETREATMENT OF TITANIUM-IRON ORES

Günter Lailach, and Jakob Rademachers, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 9, 1973, Ser. No. 377,863

Claims priority, application Germany, July 15, 1972, 2234844

Int. Cl.² C22B *1/14, 34/12;* **C01G** *23/08*

U.S. Cl. 75—3 **12 Claims**

1. In the production of a titanium dioxide concentrate from a titanium-iron ore wherein the ore is oxidized in a pretreatment, thereafter reduced to form a metallic iron in association with titanium dioxide or activated ilmenite and thereafter leached to remove iron and leave a titanium dioxide concentrate, the improvement which comprises first forming unhardened agglomerates of the titanium-iron ore, heating the unhardened agglomerates to a temperature of up to about 900°C, at least the heating from about 600° to 900°C being effected under non-oxidizing conditions thereby to avoid formation of hematite, and thereafter effecting said oxidation of the ore by heating said agglomerates at a temperature in the range of about 900° to 1200°C under oxidizing conditions until substantially all the iron has been converted into a ferro pseudobrookitepseudobrookite mixed phase.

3,926,616

LUMP ORE PRODUCTS AND METHODS OF MAKING THE SAME

Louis George Imperato, Jr., Tenafly, N.J., assignor to Blocked Iron Corporation, Montrose, N.Y.

Continuation-in-part of Ser. No. 797,825, Feb. 10, 1969, Pat. No. 3,827,876. This application Apr. 24, 1974, Ser. No. 463,728The portion of the term of this patent subsequent to Aug. 6, 1991, has been disclaimed.

Int. Cl.² C22B *1/14*

U.S. Cl. 75—3 **3 Claims**

1. A low temperature method of making ore aggregates having high strength at elevated temperatures comprising the steps of:

a. admixing finely divided metal containing ore with one of the group consisting of oxides and hydroxides of an alkaline earth metal, between about 0.005 and 0.5 percent by weight of free sulfur and sufficient water to form the mass into aggregates;

b. forming the mixture into aggregates;

c. reducing the moisture level in the aggregates below 10 percent;

d. subjecting the formed aggregates to an atmosphere of carbon dioxide until a substantial portion of the alkaline earth metal is converted to alkaline earth carbonate in situ; and

e. removing the formed aggregates to the atmosphere for storage and use.

3,926,617

PASSIVATION OF METALLIZED PELLETS IN BULK

Donald Beggs, Toledo, Ohio, and William A. Ahrendt, Lambertville, Mich., assignors to Midrex Corporation, Charlotte, N.C.

Continuation of Ser. No. 334,228, Feb. 21, 1973, abandoned. This application Sept. 6, 1974, Ser. No. 503,601

Int. Cl.² B22F *9/00*

U.S. Cl. 75—.5 BA **4 Claims**

1. In a method of passivating metallized iron pellets, a substantial portion of which have a particle size greater than 0.02 cubic inches, the steps comprising:

placing a bulk mass of metallized iron pellets in a sealable container having a gas inlet opening, a gas outlet opening and means for supplying gas to the inlet opening;

purging the container with a gas containing oxygen for a discrete period of time sufficient to replace the gas previously contained within said container; sealing the container and maintaining the bulk mass in a quiescent state wherein no wind drafting is permitted across the bulk mass for a time sufficient for said bulk mass to consume substantially all the available oxygen within the sealed container;

and repeating said purging and quiescent steps until the bulk mass substantially ceases to consume the oxygen supplied or until the bulk mass substantially ceases to heat; the number of said purging and quiescent steps and said predetermined time period of said quiescent state being selected to optimize the retained metallization of said pellets.

3,926,618

PROCESS FOR REFINING LOW-PHOSPHORUS PIG IRON TO MAKE STEEL

Helmut Knüppel; Karl Brotzmann, and Hans-Georg Fassbinder, all of Sulzbach-Rosenberg, Germany, assignors to Eisenwerk-Gesellschaft Maximilianshutte mgH, Sulzbach-Rosenberg, Germany

Continuation-in-part of Ser. Nos. 821,802, May 5, 1969, Pat. No. 3,771,998, and Ser. No. 119,258, Jan. 18, 1971, Pat. No. 3,774,894. This application Sept. 22, 1972, Ser. No. 291,434

Int. Cl.² C21C *5/34*

U.S. Cl. 75—60 **9 Claims**

1. A process for refining low-phosphorus pig iron containing in percentage by weight 0.1–3% Mn, 0.1–2% Si, and between 0.02 and 0.5% P, in a convertor in which below the surface of a bath of said pig iron and in the refractory brickwork at least one composite tuyere is disposed comprising a central tube through which a stream of oxygen is introduced into said pig iron and an outer tube through which a liquid or gaseous protective agent is introduced into said pig iron surrounding said oxygen stream which process comprises: introducing lime powder into said pig iron in said stream of oxygen, and in which process 30 to 60% of said lime powder is injected during the desiliconizing of said pig iron.

3,926,619

REFINING PROCESS

Arlette Therese Etienne, Boncelles, Belgium, assignor to Centre de Recherches Metallurgiques, Liege, Belgium

Filed July 2, 1974, Ser. No. 485,198

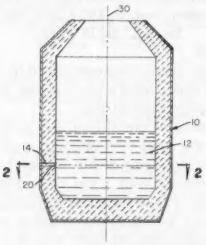
Claims priority, application Belgium, July 10, 1973, 802163

Int. Cl.² C21C *5/34*

U.S. Cl. 75—60 **6 Claims**

1. An iron refining process carried out in an iron refining converter having two tuyeres for blowing oxidising gas into the hot metal below its upper surface, in which, assuming the axis of the converter to be vertical, the two tuyeres have substantially horizontal axes inclined in opposite directions with respect to the diametral plane of the converter which is equidistant from the respective zero points (as defined hereinbefore) of the tuyeres, the projection of the axis of each tuyere in a horizontal plane forming an angle of 5° to 20° with the diame-

ter passing through its zero point, the intersection, if any, of the projections of the tuyere axes in a common horizontal plane being remote from the straight line joining the zero points with respect to the converter axis, the projection of the



zero points in a common horizontal plane being separated by an arc whose angle is 40° to 135°, wherein oxidizing gas is blown into the molten iron to be refined through the two tuyeres simultaneously.

3,926,620

LOW CARBON NI-CR ALLOY STEEL HAVING AN IMPROVED RESISTANCE TO STRESS CORROSION CRACKING

Masamichi Kowaka, Toyonaka, and Hisao Fujikawa, Nishinomiya, both of Japan, assignors to Sumitomo Metal Industries Ltd., Japan

Continuation-in-part of Ser. No. 161,289, July 9, 1971, abandoned. This application Feb. 7, 1974, Ser. No. 440,470
Claims priority, application Japan, July 14, 1970, 45-62463
Int. Cl.² C22C *38/46, 38/54, 38/34*
U.S. Cl. 75—122 **3 Claims**

1. A low carbon Ni-Cr alloy steel being substantially in the single phase of austenite and improved in resistance to stress corrosion cracking, consisting essentially of, by weight, less than 0.03% of carbon, 1.5 to 4.0% silicon, 0.1 to 3.0% of manganese, 25 to 45% of nickel, 24 to 35% of chromium, 0.9 to 4.0% of vanadium and the balance essentially of iron.

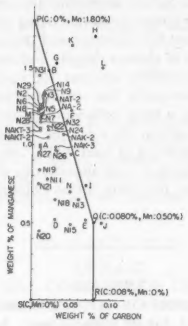
3,926,621

COLD WORKABLE AND AGE-HARDENABLE STEEL

Chiaki Asada, Nagoya, and Toshiyuki Watanabe, Nishio, both of Japan, assignors to Daido Seiko Kabushiki Kaisha, Nagoya, Japan

Division of Ser. No. 187,825, Oct. 8, 1971, Pat. No. 3,856,514. This application May 2, 1974, Ser. No. 466,512
Claims priority, application Japan, Oct. 19, 1970, 45-91150
Int. Cl.² C22C *38/06, 38/16*
U.S. Cl. 75—124 **5 Claims**

1. A cold workable and age-hardenable steel, characterized in that it consists essentially of the weight percentages of carbon and manganese within the area enclosed by the line connecting points P, Q and R to the point S as shown in the accompanying FIG. 1; an effective amount up to 0.6 weight % of silicon, and, as age-hardenability improving alloying metals, more than 2.5 weight % of nickel, more than 0.6 weight % of aluminum, more than 0.5 weight % of copper and more than 0.5 weight % of titanium, the total amount of nickel, aluminum, copper and titanium being in the range of from 4.5 to 6.5 weight %, said point P indicating zero weight % of carbon and 1.8 weight % of manganese, said point Q indicating 0.08 weight % of carbon and 0.5 weight % of manganese, said point R indicating 0.08 weight % of carbon and zero weight % of manganese and said point S indicating zero weight % of carbon and zero weight % of manganese, and further consisting of as machinability improving alloying metals, at least one element selected from the group consisting of an effective amount up to 0.3 weight % of sulphur, an effective amount up to 0.4 weight % of lead, an effective amount up to 0.5 weight % of selenium, an effective amount up to 0.3 weight % of



tellurium and an effective amount up to 0.3 weight % of bismuth.

3,926,622

PITTING RESISTING ALLOY STEELS

Kingo Kiyonaga, Yonago, and Yoshiyuki Murakawa, Yasugi, both of Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Sept. 30, 1974, Ser. No. 510,542
Claims priority, application Japan, Oct. 3, 1973, 48-110512
Int. Cl.² C22C *38/18*
U.S. Cl. 75—126 G **12 Claims**

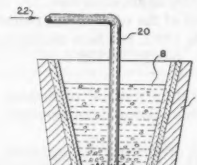
10. Pitting resisting alloy steels consisting essentially of by weight 0.01 to 2.0 % cerium, 0.6 to 1.0 % carbon, 8.0 to 13.0 % chromium, less than 2.0 % silicon, less than 2.0 % manganese, and the balance iron and impurities.

3,926,623

PROCESS FOR PURIFICATION OF MANGANESE ALLOYS

Naaman H. Keyser, Hinsdale, and Akgun Mertdogan, Homewood, both of Ill., assignors to Interlake, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 317,044, Dec. 20, 1972, abandoned, which is a continuation of Ser. No. 46,010, June 15, 1970, abandoned. This application Dec. 4, 1974, Ser. No. 529,682
Int. Cl.² C22C *35/00*
U.S. Cl. 75—129 **12 Claims**



1. A method for producing ferro-alloys from a manganese containing ore for use in steel production, the steps comprising,

providing an input melt from manganese containing ore with said input melt comprising a manganese-containing material selected from a group consisting of:

a. a silico-manganese ferro-alloys,

b. a manganese-silicon ferro-alloy,

c. a low carbon ferro-manganese, and
d. a massive manganese,
said input melt containing a molten impurity content selected from the group consisting of:
a. lead,
b. arsenic, and
c. zinc
providing the impurity content in an amount in excess of 0.01 by weight,
providing a carrier gas of the type which does not generally react or combine with the materials of said input melt or said impurity content at a temperature above the melting temperature of said impurity content, but below the vaporization temperature thereof,
blowing said carrier gas entirely through said input melt so that it will pass out of the input melt,
maintaining the temperature of said input melt above the melting temperature of said impurity content while blowing said carrier gas therethrough and,
separating said impurity content from said input melt by said carrier gas to cause said impurity content to be evaporated and removed as a gaseous vapor in substantially its elemental state along with said carrier gas as it passes out of said input melt to reduce the impurity content in said melt to an amount less than 0.01% by weight.

3,926,624

PRODUCTION OF FERRITIC STAINLESS STEELS CONTAINING ZIRCONIUM

Arthur H. Aronson, Pittsburgh, and Charles R. Rarey, Eighty-Four, both of Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Mar. 17, 1972, Ser. No. 235,849
Int. Cl.[2] C22C *33/00*
U.S. Cl. 75—130.5 **3 Claims**

1. The process of making a fully ferritic stainless steel slab characterized by its ability to resist surface cracking during grinding and thus be suitable for rolling into strip consisting essentially of preparing a melt of steel consisting essentially of carbon, nitrogen, approximately 1% maximum manganese and silicon, approximately 0.04% maximum phosphorus, approximately 0.03% maximum sulfur, ferrite forming elements including a minimum of approximately 16% chromium to render the resulting steel ferritic at all temperatures below its melting point, zirconium in percentage by weight between about seven times and about fourteen times the combined carbon and nitrogen percentages by weight to effectively suppress the formation of cracks during surface grinding of a slab formed from the melt, balance iron, processing the melt into a slab, and grinding at least one surface thereof.

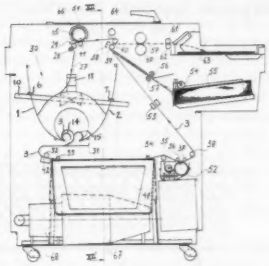
3,926,625

PHOTOCONDUCTIVE BELT DEVICE AND ELECTROPHOTOGRAPHIC PROCESS AND APPARATUS UTILIZING THE SAME

Martin Leonard van der Sterren, Horst, Netherlands, assignor to Oce-van der Grinten N.V., Venlo, Netherlands

Continuation of Ser. No. 226,413, Feb. 15, 1972, abandoned.
This application June 18, 1973, Ser. No. 370,680
Claims priority, application Netherlands, Apr. 29, 1971, 7105941
Int. Cl.[2] G03G *13/22*, *15/22*
U.S. Cl. 96—1 R **18 Claims**

6. A process of indirect electrophotographic copying which comprises:
storing in the dark most of the length of a long endless belt of flexible photoconductive sheet material that exhibits memory effect and that has been pre-folded zigzag on transverse fold lines at regular intervals throughout its length so as to be subdivided by the successive fold lines into individual belt sections each slightly larger than the largest copy to be produced, said stored belt length being in a stack composed of a great number of said belt sections folded zigzag one upon another on the respective fold lines bordering them and the remaining, minor portion of the length of said belt being extended lengthwise from one end of said stack through a processing path passing a series of electrophotographic processing stations and thence onto the other end of said stack;
for each copying operation: imagewise exposing one of said belt sections at one of said stations to light from an original so as to form on the exposed belt section a latent image of the original, transporting said extended belt portion lengthwise through said path so as to move said exposed belt section past further of said stations, thus correspondingly drawing from said one stack end into said path aforesaid belt sections trailing said exposed section and depositing onto said other stack end aforesaid belt sections leading said exposed section, and at another



of said stations transferring from said exposed section to a receiving material said latent image or a toner image developed on said latent image; said depositing being effected by folding the belt zigzag on the respective preformed fold lines bordering said leading belt sections;
continuing copying operations by subjecting to respective exposing, transporting and transferring steps as aforesaid individual belt sections aforesaid drawn from said stack into said path, thus in the course of continued copying operations transporting the entire length of said belt repeatedly through said path and said stack;
and maintaining in the dark in said stack such a great number of said belt sections that any one of them which has been exposed in said path will become substantially rid of memory effect during storage in said stack, before being again drawn from said stack for another exposure.

3,926,626

CIRCULATION IMAGING METHOD

Lloyd Bean, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 29, 1973, Ser. No. 327,543
Int. Cl.[2] G03G *13/22*
U.S. Cl. 96—1 R **27 Claims**

1. A method for imaging comprising:
a. providing an imaging member comprising on an about 1 to about 12 micron thick softenable circulation layer a softenable photoconductive layer of about 0.5 to about 5 micron thickness; each of said layers comprising electrically insulating softenable material and said photoconductive layer comprising a volume ratio of about 1:8 to about 7:1 photosensitive particles dispersed in softenable material; said softenable layers capable of having their viscosity reduced so as to allow circulation of material therein in response to a charge density, of from about 10 to about 80 volts per micron and cast from materials sufficiently dissimilar wherein mixing of imaging member layers in bulk in the absence of circulation is prevented;
b. charging the surface of said imaging member at least at said charge density;

c. imagewise exposing said imaging member to activating electromagnetic radiation; and

d. softening said softenable layers by reducing their viscosity wherein circulation of said softenable layers occurs sufficiently to effect bulk mixing of said softenable layers in non-imagewise-exposed portions of said imaging member; the resultant mixture of said layers having at least one chemical or physical property that is distinct from that of at least one of said softenable layers in unmixed portions of said imaging member.

3,926,627

PROCESS FOR MAKING AN ELECTROPHOTOGRAPHIC IMAGE BY USE OF PHOTOCONDUCTIVE PARTICLES

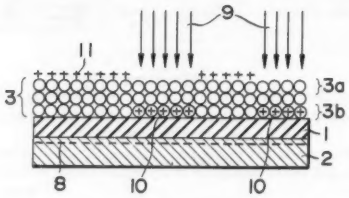
Masakazu Iwasa, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 21, 1974, Ser. No. 453,421

Claims priority, application Japan, May 7, 1973, 48-50428

Int. Cl.[2] G03G *13/22*

U.S. Cl. 96—1 R **29 Claims**



1. A process for making an electrophotographic image by use of photoconductive particles comprising the steps of:

providing a plurality of layers of photoconductive particles on a substrate having at least an insulating upper surface, providing a uniform charge to the upper part of the layer of said photoconductive particles,

exposing the layers of photoconductive particles to imagewise light to move the charges in the upper part of the layers to the lower part thereof in the area exposed to the light,

neutralizing from a charging means external to the substrate the charges on the outer surface of the layers in the area not exposed to the light, and

removing said photoconductive particles from the surface of said recording medium to leave the particles which received the charge moved from the upper part of the layers.

3,926,628

USING PHOTOCONDUCTIVE AND NON-PHOTOCONDUCTIVE POWDERS

Satoru Honjo, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 2, 1974, Ser. No. 466,451

Claims priority, application Japan, May 2, 1973, 48-49327

Int. Cl.[2] G03G *13/22*

U.S. Cl. 96—1 R **7 Claims**

1. An electrostatic powder coating method comprising, exposing a layer of charged photoconductive toner particles formed on an electrically conductive substrate to an optical image, the photoconductive toner particles having a main resinous component;

selectively attempting to remove all of the irradiation discharged toner particles from said toner layer at the irradiated areas to form a toner image corresponding to said optical image where a small amount of the toner particles undesirably remain in the irradiation discharged area;

then, while the remaining charged toner layer still retains a sufficient amount of electrical charge, electrostatically spraying a second powder having a main resinous component and having the same charge polarity as that of said toner layer over the toner image bearing surface whereby said second powder is preferentially deposited on the irradiated areas of said image bearing surface;

fusing said photoconductive toner particles and said second powder particles by heating to form a continuous film, wherein the affinity between a main resinous component of said photoconductive toner and that of said second powder is high and both main resinous components are compatible with each other when fused by heating; and

discharging the charged toner particles of said charged toner layer by uniform irradiation and removing said discharged toner particles from the substrate, after electrostatically spraying said second powder over the toner image bearing surface so that all of the removed toner particles may be reused.

3,926,629

ELECTROPHOTOGRAPHIC METHOD AND PLATE EMPLOYING A PHTHALDCYANINE POLYMER

John W. Weigl, W. Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 18,754, March 11, 1970, abandoned, which is a continuation-in-part of Ser. No. 468,983, July 1, 1965, abandoned. This application Dec. 17, 1973, Ser. No. 425,653

Int. Cl.[2] G03G *5/07, 13/00, 17/04*

U.S. Cl. 96—1.5 **12 Claims**

9. A xerographic plate comprising an electrophotographic film of a polymer in which at least one of the recurring molecular units includes the phthalocyanine molecule, said polymer comprising at least one recurring molecular unit in addition to the unit including phthalocyanine, said additional unit being characterized in that it imparts flexibility and toughness to the interpolymer which it forms with said phthalocyanine including unit.

3,926,630

PRODUCTION OF POSITIVE COLOUR IMAGES UTILIZING A PHOTOGRAPHIC MATERIAL CONTAINING A SPIROPYRAN COMPOUND AND A POLYHALOGEN COMPOUND

Jozef Willy Van den Houte, Berchem, Belgium, assignor to Agfa-Gevaert, Mortsel, Belgium

Division of Ser. No. 334,247, Feb. 21, 1973, abandoned. This application Sept. 26, 1974, Ser. No. 509,338

Claims priority, application United Kingdom, Feb. 22, 1972, 8164/72

Int. Cl.[2] G03C *5/04, 5/24*

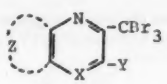
U.S. Cl. 96—27 E **10 Claims**

1. A photographic process in which a positive color image is produced by the steps of:

1. imagewise exposing a photosensitive recording material containing a photosensitive dye-forming composition comprising:

a. as dye precursor compound at least one spiropyran compound of the group consisting of a spirodibenzopyran, a spirodinaphthopyran, a spirobenzonaphthopyran, a 1,3,3-trimethylindolinobenzospiropyran, a 1,3,3-trimethylindolinonaphthospiran or a spiropyran that contains an anthracene or phenanthrene nucleus,

b. at least one ultraviolet sensitive polyhalogen compound corresponding to the following general formula:



in which:

X represents a methine group or nitrogen,

Y represents hydrogen, a lower alkyl group or $-CBr_3$, and

Z represents the necessary atoms to close a benzene nucleus,

to ultraviolet radiation of an intensity sufficient to produce at least a colored image in the exposed areas,

2. heating the recording material until the colored image has been bleached, and

3. overall exposing the recording material to active electromagnetic radiation of an intensity sufficient to produce a color image in the initially unexposed areas thereof.

3,926,631

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Atsuaki Arai; Yasushi Oishi; Minoru Yamada; Nobuo Furutachi, and Kotaro Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

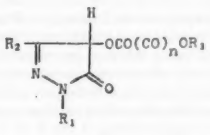
Filed Apr. 15, 1974, Ser. No. 461,204

Claims priority, application Japan, Apr. 13, 1973, 48-41869

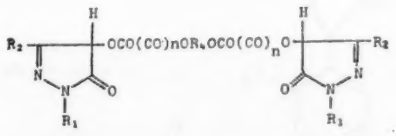
Int. Cl.² G03C *5/54, 1/40*

U.S. Cl. 96—29 D **20 Claims**

20. A process of forming a color image which comprises developing a light-sensitive material comprising a support having thereon a silver halide photographic emulsion layer in combination with a magenta-forming coupler having the General Formula (I) or (II)



(I)



(II)

wherein *n* is 0 or 1 R_1 is a hydrogen atom or a group having 1 to about 50 carbon atoms selected from the group consisting of a straight chain or branched chain alkyl group; an alkenyl group; a cycloalkyl group; a substituted alkyl or substituted cycloalkyl group containing as a substituent, a halogen atom or a nitro, cyano, aryl, alkoxy, aryloxycarboxy, alkoxycarbonyl, aryloxycarbonyl, sulfo, sulfamoyl, carbamoyl, acylamino, ureido, heterocyclic, arylsulfonyloxy or oxo group; a substituted aryl group containing at least one of an alkyl, alkoxy, aryloxy, carboxy, alkoxycarbonyl, acylamino, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl, arylcarbamoyl, alkylsulfonamido, arylsulfonamido, sulfamoyl, alkylsulfamoyl, cyano and nitro groups or halogen atoms as a substituent; a heterocyclic group containing, as a hetero-atom, a nitrogen, oxygen and/or sulfur atom; a substituted heterocyclic group with the substituents above described for the aryl group; a carbamoyl group and a thiocarbamoyl group;

R_2 represents a group having 1 to about 50 carbon atoms selected from the group consisting of the same alkyl, substituted alkyl, aryl, substituted aryl, heterocyclic or substituted heterocyclic groups as described for R_1; an alkoxycarbonyl group; an aryloxycarbonyl group; an aralkyloxycarbonyl group; an alkoxy group; an aryloxy group; an alkythio group; an arylthio group; a carboxy group; an amino group; an alkylamino group; a cycloalkylamino group, an N,N-dialkylamino group; an N-alkyl-N-arylamino group; an N-arylamino group; an amido group; an N-alkylacylamino group; an N-arylacylamino group; a ureido group; an N-arylureido group; an N-alkylureido group; a thioureido group; an N-alkylthioureido; an N-arylthioureido group; a carbamoyl group; a sulfamoyl group; a piperidino group; a pyrrolidino group; a guanidino group; an N-alkylguanidino group; and an N-arylguanidino group;

R_3 represents a group having 1 to about 30 carbon atoms selected form the group consisting of a straight chain or branched chain alkyl group; an alkenyl group; a cycloalkyl group; an alkyl or cycloalkyl group substituted with a halogen atom or a nitro, cyano, aryl, alkoxy, carboxyester, sulfoester, amido, sulfonamido, ureido, carbamyl or sulfamyl group; an aryl group substituted with one or more halogen atoms, or nitro, cyano, alkyl, aryl, alkoxy, aryloxy, alkoxycarbonyl, acyl, arylcarbonyl, alkylsulfonyl, arylsulfonyl, sulfoester, amido, sulfonamido, ureido, carbamyl and sulfamyl groups; a heterocyclic group containing, as a hetero-atom, a nitrogen, oxygen and/or sulfur atom, and a substituted heterocyclic group containing substituents above described for the aryl group;

R_4 represents a divalent group having from 1 to 30 carbon atoms selected from the group consisting of as an alkylene group and an arylene group;

wherein either R_1 or R_2 may form a divalent group of about 30 or less carbon atoms linking two 5-pyrazolone moieties of the General Formula (I) and/or (II); and in which at least one of R_1 and R_2 contains a water-solubilizing sulfo, carboxyl or sulfonamido group and R_3 is a hydrophobic group of either or more carbon atoms with an alkaline aqueous solution containing an aromatic primary amine color developing agent and then transferring the resultant magenta dye to a receiving layer containing a basic polymer.

3,926,632

PHOTOGRAPHIC SILVER HALIDE LITH MATERIAL

Emiel Alexander Hofman, Mortsel; Jules Robert Berendsen, Deurne, and Robert Joseph Pollet, Vremde, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Aug. 11, 1972, Ser. No. 279,795

Claims priority, application United Kingdom, Sept. 13, 1971, 42562/71

Int. Cl.² G03C *5/30, 1/34*

U.S. Cl. 96—66.5 **10 Claims**

1. Method of producing a high contrast image by development in a developer which contains hydroquinone or a hydro-

quinone drivative having a low sulphite ion content and at a temperature above 30°C. of an exposed photographic light-sensitive lithmaterial which will provide a characteristic curve with a short toe and high gamma and which will produce sharply defined images with high density extending to the edges of lines and dots comprising a support having thereon at least one light-sensitive high contrast silver halide emulsion having a fine grain, which comprises at least 50 mole percent of silver chloride and at least 5 mole percent of silver bromide, wherein the said material comprises a disulphide compound of the formula:

$$X - A_1 - S - S - A_2 - Y$$

wherein:

each of A_1 and A_2 represents an alkylene group, an arylene group, or a benzthiazolyl group, and

each of X and Y represents a water-solubilizing group in acid or salt form, or a substituent carrying a water-solubilizing group, said substituent forming a bridging group between the water-solubilizing group and A_1 and A_2 selected from a saturated or unsaturated aliphatic group, an aromatic group and a benzimidazolylene group.

3,926,633

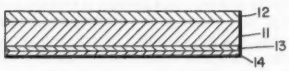
MOTION PICTURE FILM SOUNDTRACK AND METHOD FOR PRODUCTION THEREOF

Peter Anderson Custer, Newtown, Bucks County, Pa. 18940

Filed July 2, 1973, Ser. No. 375,812

Int. Cl.² G03C *1/76, 7/24, 5/14*

U.S. Cl. 96—68 **5 Claims**



1. A photographic film comprising a base, a visible light sensitive silver halide emulsion layer and an infra-red sensitive silver halide emulsion soundtrack layer, said soundtrack layer containing an ultra-violet fluorescent compound.

3,926,634

COLOR SILVER HALIDE PHOTOGRAPHIC MATERIALS CONTAINING COUPLERS HAVING AN OLEOPHILIC GROUP

Atsushi Sugizaki; Takeshi Hirose; Yukio Yokota; Akio Okumura; Yasushi Oishi, and Atsuaki Arai, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

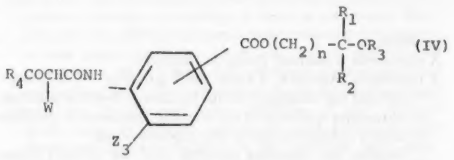
Filed Mar. 27, 1974, Ser. No. 455,090

Claims priority, application Japan, Mar. 27, 1973, 48-35379

Int. Cl.² G03C *1/40*

U.S. Cl. 96—100 **7 Claims**

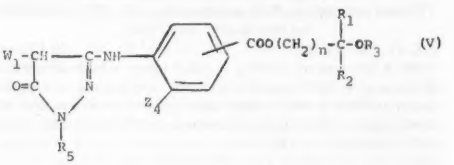
1. A color photographic material comprising a support having thereon at least one silver halide emulsion layer containing at least one coupler capable of forming a dye by an oxidative coupling reaction with the oxidation product of an aromatic primary amino developing agent, wherein said coupler is selected from the group consisting of couplers represented by the general formulae (IV), (V), (Va), (VI) or (VIa) below:



(IV)

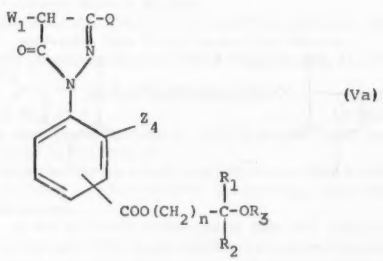
where n represents an integer from 1 to 7,

R_1 and R_2 each represents a hydrogen atom or an alkyl group; R_3 represents an aryl group; R_4 represents an aliphatic residue, an aromatic residue, or a heterocyclic residue, W represents a hydrogen atom or a coupling residue capable of being released by oxidative coupling with the oxidation product of an aromatic primary amino developing agent, and Z_3 represents a hydrogen atom, an alkyl residue, an alkoxyl residue, an aryloxy residue, an amino residue, or a halogen atom, said alkoxycarbonyl group being at the 4- or 5-position of the anilide ring;



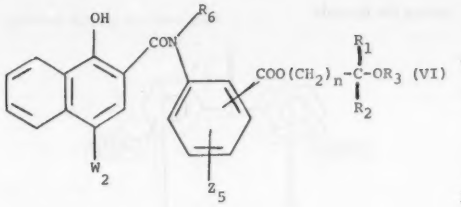
(V)

wherein R_1, R_2, R_3 and n have the same meaning as in general formula (IV); R_5 represents an aromatic residue or a heterocyclic residue, W_1 represents a hydrogen atom or a coupling residue capable of being released by oxidative coupling with the oxidation product of an aromatic primary amino developing agnet, and Z_4 represents a hydrogen atom, an alkyl residue, an alkoxyl residue, an aryloxy residue, or a halogen atom, the alkoxycarbonyl group being at the 4- or 5-position of the anilino ring;

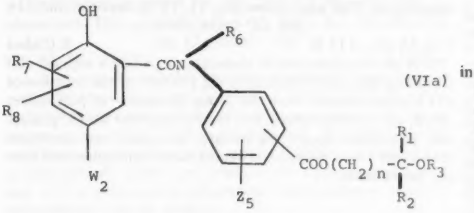


(Va)

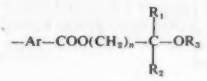
wherein R_1, R_2, R_3, W_1, Z_4 and n have the same meaning as described with respect to general formula (V), Q represents an alkyl residue, an alkoxy residue, a N-alkylamino residue, an anilino residue or an acylamino residue;



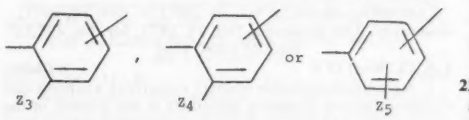
wherein R_1, R_2, R_3 and n have the same meaning as in general formula (IV), R_6 represents a hydrogen atom or an alkyl group having less than 5 carbon atoms, W_2 represents a hydrogen atom or a coupling residue capable of being released by oxidative coupling with the oxidation product of an aromatic primary amino developing agent, and Z_5 represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxyl group, and aryl group, an aryloxy group, an amino group, or an acylamino group; or



wherein R_1, R_2, R_3, R_6, W_2, Z_5 and n have the same meaning as described with respect to general formula (VI), R_7 and R_8 each represents a hydrogen atom, a halogen atom, an alkyl group or an alkoxy group; wherein the alkoxycarbonylarylene group of said couplers has from about 15 to 50 carbon atoms, said group being representable by the formula:



wherein -Ar- is



for couplers of the general formula IV, (V) +(Va) and (VI) + (VIa), respectively.

3,926,635
PHOTOGRAPHIC MATERIAL WITH POLYMERIC STABILIZERS

Wilhelm Saleck, Schildgen; Helmut Engelhard, Dormagen; Wolfgang Himmelmann, Opladen; Francis Bentz, Cologne, and Helmut Mader, Odenthal-Hahnenberg, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

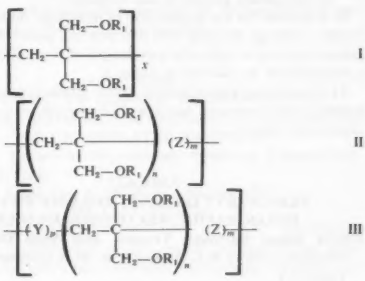
Filed June 20, 1974, Ser. No. 481,187

Claims priority, application Germany, June 27, 1973, 2332562

Int. Cl.² G03C *1/04, 1/34*

U.S. Cl. 96—114 **5 Claims**

1. A light-sensitive photographic material containing at least one silver halide emulsion layer, said emulsion layer containing at least one compound of the formulae:



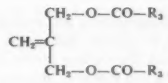
in which

R_1 represents H, alkyl, aryl, cyanoalkyl or -CO-NHR$_2$,

R_2 represents H, alkyl, cycloalkyl, aryl or alkoxy alkyl,

Z represents acrylic, methacrylic, fumaric or maleic acid groups, optionally in a salt form, an N-alkyl-, N-hydroxyalkyl- or N-oxoalkyl acrylamide or methacrylamide group, furmaric or maleic acid semiamide optionally in a salt form, mono- or dihydroxyalkyl acrylate or methacrylate, sulphoalkyl acrylate or methacrylate, or vinyl-pyrrolidone, -caprolactam, -piperidine or -imidazole,

Y = polymerisable group selected from styrene, acrylic acid esters or



wherein R_3 represents methyl or ethyl,

$X = 3 - 17$

$n = 5 - 99.5$ mols-% and

$m = 95 - 0.5$ mols-% when $p = 0$ and

$n = 5 - 80$ mols-%,

$m = 50 - 10$ mols-% and

$p = 45 - 10$ mols-% when p 0.

3,926,636
PHOTOCURABLE COMPOSITIONS

Helmut Barzynski; Matthias Marx, both of Bad Durkheim; Gerhard Storck, Ruchheim, and Dietrich Saenger, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 28, 1973, Ser. No. 392,242

Claims priority, application Germany, Aug. 29, 1972, 2242394

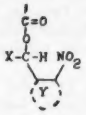
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² G03C *1/70*

U.S. Cl. 96—115 R **12 Claims**

1. A composition curable under the action of light which consists of:

A. at least one substance containing at least two aromatic or heteroaromatic o-nitrocarbinol ester groups of the general formula:



in which Y is an aromatic or pyridine ring system of five to 14 ring members and X is hydrogen or alkyl of one to eight carbon atoms or an aryl or aralkyl of up to 12 carbon atoms; and

B. at least one compound with at least two aziridine groups or isocyanate groups in the molecule.

9. A process for the production of moldings, impregnations, bonds, coatings, printing inks and printing plates which comprises exposing to light of a wavelength of from 200 to 500 nm a composition as claimed in claim **1**.

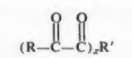
11. A molding, impregnation, bond, coating, printing ink or printing plate prepared using a photocurable composition as claimed in claim **1**.

3,926,637
PERMANENT ORGANIC VOLUME PHASE HOLOGRAPHIC RECORDING MEDIUM

Robert Alfred Bartolini, Trenton, and Allen Bloom, East Windsor, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 4, 1973, Ser. No. 403,408
Int. Cl.² G03C *1/76, 3/00, 5/04*
U.S. Cl. 96—115 R **5 Claims**

1. A medium for recording permanent volume phase holograms consisting essentially of a cured, transparent acrylic polyester polymer containing an α-diketone which is soluble in said polyester and is capable of intermolecular hydrogen atom abstraction with said polyester and which has the formula



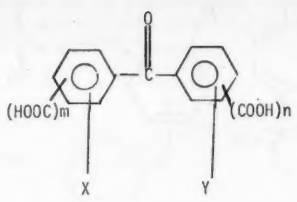
wherein R and R′ independently are selected from the group consisting of methyl, branched chain alkyl and cyclic hydrocarbon groups wherein the carbon atoms are part of an aromatic or aliphatic ring and R and R′ together can form part of an aromatic or aliphatic ring; and x is **2**; said α-diketone being present in an amount sufficient to cause a permanent change in the index of refraction of said medium when illuminated by a spatially modulated coherent light beam having a wavelength corresponding to the absorption band wavelength tail of said α-diketone.

3,926,638
PHOTOPOLYMERIZABLE COMPOSITIONS COMPRISING MONOCARBOXYL-SUBSTITUTED BENZOPHENONE REACTION PRODUCTS

George Rosen, Wayne; Daniel J. Carlick, Livingston, and Ralph H. Reiter, Wayne, all of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 200,174, Nov. 18, 1971, abandoned. This application Oct. 11, 1973, Ser. No. 405,515
Int. Cl.² G03C *1/68*
U.S. Cl. 96—115 R **7 Claims**

1. A photopolymerizable element comprising a support and a coating thereon consisting of the product of the reaction of (1) a resin selected from the group consisting of polyamide, alkyd, oil-modified alkyd, isocyanate-modified alkyd, polester, polyether, epoxy, carbamate, phenolic, and urethane resins and (2) a monocarboxy-substituted benzophenone having the formula



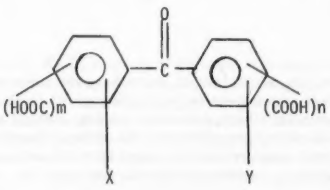
wherein m and n is each 0 or 1 and the sum of m and n is 1; and X and Y is each 1 to 4 halogen atoms or dialkylamino groups having 1 to 4 carbon atoms; X and Y may be the same or different and either or both may be omitted.

3,926,639
PHOTOPOLYMERIZABLE COMPOSITIONS COMPRISING POLYCARBOXYSUBSTITUTED BENZOPHENONE REACTION PRODUCTS

George Rosen, Wayne; Daniel J. Carlick, Livingston, and Ralph H. Reiter, Wayne, all of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 200,174, Nov. 18, 1971, abandoned. This application Oct. 11, 1973, Ser. No. 405,516
Int. Cl.² G03C *1/68*
U.S. Cl. 96—115 R **8 Claims**

1. A photopolymerizable element comprising a support and a coating thereon consisting of the product of the reaction of (1) a resin selected from the group consisting of polyamide, alkyd, oil-modified alkyd, isocyanate-modified alkyd, polyester, polyether, epoxy, carbamate, phenolic, and urethane resins and (2) a polycarboxy-substituted benzophenone having the formula



wherein m and n is each an integer from 0 to 3 and the sum of m plus n is in the range of 2 to 6; and X and Y is each 1 to 4 halogen atoms or dialkylamino groups having 1 to 4 carbon atoms; X and Y may be the same or different and either or both may be omitted.

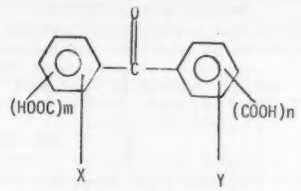
3,926,640
PHOTOPOLYMERIZABLE COMPOSITIONS COMPRISING BENZOPHENONE REACTION PRODUCTS

George Rosen, Wayne, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 200,174, Nov. 18, 1971, abandoned. This application Oct. 11, 1973, Ser. No. 405,517
Int. Cl.² G03C *1/68*
U.S. Cl. 96—115 P **6 Claims**

1. A photopolymerizable element comprising a support and a coating thereon consisting essentially of the product of the reaction of (1) a hydroxy-containing polyethylenically unsaturated ester or an isocyanate-modified hydroxy-containing polyethylenically unsaturated ester which is the product of the reaction of (a) an ethylenically unsaturated acid and (b) a polyhydric alcohol and (2) a monocarboxy-substituted benzo-

phenone having the formula



wherein *m* and *n* is each 0 or 1 and the sum of *m* plus *n* is 1; and X and Y is each 1 to 4 halogen atoms or dialkylamino groups having 1 to 4 carbon atoms; X and Y may be the same or different and either or both may be omitted.

3,926,641

PHOTOPOLYMERIZABLE COMPOSITIONS COMPRISING POLYCARBOXYSUBSTITUTED BENZOPHENONE REACTION PRODUCTS

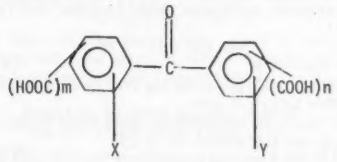
George Rosen, Wayne, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 200,174, Nov. 18, 1971, abandoned. This application Oct. 11, 1973, Ser. No. 405,518

Int. Cl.² G03C *1/68*

U.S. Cl. 96—115 P **6 Claims**

1. A photopolymerizable element comprising a support and a coating thereon of the product of the reaction of (1) a hydroxyl-containing polyethylenically unsaturated ester or an isocyanate-modified hydroxyl-containing polyethylenically unsaturated ester which is the product of the reaction of (a) an ethylenically unsaturated acid and (b) a polyhydric alcohol and (2) a polycarboxy-substituted benzophenone acid or anhydride having the formula



wherein *m* and *n* is each an integer from 0 to 3 and the sum of *m* plus *n* is in the range of 2 to 6; and X and Y is each 1 to 4 halogen atoms or dialkylamino groups having 1 to 4 carbon atoms; X and Y may be the same or different and either or both may be omitted.

3,926,642

PHOTOPOLYMER LITHOGRAPHIC PLATE ELEMENT

David S. Breslow, and David A. Simpson, both of Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 305,209, Nov. 9, 1972, Pat. No. 3,847,609. This application Mar. 25, 1974, Ser. No. 454,624

Int. Cl.² G03C *1/68*

U.S. Cl. 96—115 R **2 Claims**

1. A lithographic plate element comprising a support and a layer of a composition comprising a photooxygenation sensitizer and a cross-linked polymer containing extralinear olefinic unsaturation of the type in which there is no more than one hydrogen atom on each of the double bond carbons and in which there is at least one allylic hydrogen on at least one of the carbons adjacent to the double bond carbons.

3,926,643

PHOTOPOLYMERIZABLE COMPOSITIONS COMPRISING INITIATOR COMBINATIONS COMPRISING THIOXANTHENONES

Catherine Teh-lin Chang, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed May 16, 1974, Ser. No. 470,637

Int. Cl.² G03C *1/68, 1/70*

U.S. Cl. 96—115 P **9 Claims**

1. In a photopolymerizable composition the improvement comprising the combination of a thioxanthenone photoinitiator and at least one other photoinitiator selected from the group consisting of a lophine dimer, a polynuclear quinone compound, 2,3-bornanedione, 4,4′-bis(dimethylamino) benzophenone, and benzoin methyl ether.

9. In a photopolymerizable composition the improvement comprising a photoinitiating mixture of thioxanthenone and 3,6-bis(dimethylamino) thioxanthenone.

3,926,644

TREATMENT OF ORGANIC BIODEGRADABLE MATERIALS WITH MONOCHLOROACETATE ESTERS OF CHLORINATED PHENOLS

Saul Kaye, Evanston, Ill., assignor to Ferro Corporation, Cleveland, Ohio

Filed Aug. 8, 1974, Ser. No. 495,563

Int. Cl.² C08J *3/20*

U.S. Cl. 106—15 AF **22 Claims**

1. In the combination of an organic biodegradable polymeric material and a biostatic agent comprising a chlorinated phenol normally adversely affecting desirable properties of said material, the improvement comprising a biostatic amount of a biostatic agent consisting essentially of a chlorinated, esterified phenol selected from the group consisting of a 2,2′ methylene bis (ester of chlorinated phenol) and an ester of chlorinated phenol in which each ester group consists of —$OCOCH_2Cl$, said agent being adapted to reduce the susceptibility of said material to degradation by microorganisms without appreciably deteriorating other desirable physical properties of the material.

3,926,645

SYMPATHETIC INK

Walter Strahl, 185 W. End Ave., New York, N.Y. 10023

Filed Jan. 25, 1974, Ser. No. 436,646

Int. Cl.² C09D *11/00, 11/14*

U.S. Cl. 106—21 **5 Claims**

1. A sympathetic ink which is invisible when applied to paper or other materials having an absorbent surface and which becomes visible on wetting said paper or other material, said ink consisting of a halogenated hydrocarbon solvent consisting essentially of methylene chloride having dissolved therein between about 0.25% and about 1% of a substantially colorless, substantially water insoluble cellulose ether of a degree of substitution of at least 2.42 and an ethoxyl content of at least 47.5%.

3,926,646

PREPARATION OF DENTAL CEMENTS

Kiyoshi Inoue, No. 16-8 3-chome, Kami-Yoga, Setagaya-ku, Tokyo, Japan

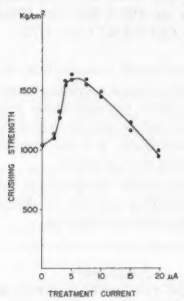
Continuation of Ser. No. 873,204, Nov. 3, 1969, abandoned, which is a continuation-in-part of Ser. No. 731,258, May 22, 1968, abandoned. This application Apr. 26, 1974, Ser. No. 464,367

Int. Cl.² C09K *3/00*

U.S. Cl. 106—35 **12 Claims**

1. In the method of making a settable dental cement in paste form wherein finely divided oxide material is mixed with a liquid containing phosphoric acid and water to form a dental paste admixture, the improvement consisting essentially of preparing such admixture, incorporating from 0 to 20% fluo-

ride compound therein, spatulating the resultant admixture for from 0.5 to 5 minutes to form said paste, and applying an electric field by low-power electrical energy across said admixture to cause an electric current of microampere order to pass therethrough during spatulation for a time sufficient to form a dental cement of enhanced crushing strength when set, as compared with that of such cement not so treated.



3,926,647

PROCESS FOR THE PRODUCTION OF SYNTHETIC WOLLASTONITE AND DIOPSIDE

Josef Wuhrer, Wulfrath, Germany, assignor to Rheinische Kalksteinwerke GmbH, Germany

Continuation-in-part of Ser. No. 102,895, Dec. 30, 1970, abandoned. This application Aug. 2, 1973, Ser. No. 384,923

Claims priority, application Germany, Aug. 2, 1972, 2237906

Int. Cl.² C04B *35/16*

U.S. Cl. 106—39.5 **13 Claims**

1. A process for the production of a synthetic material selected from the group consisting of wollastonite, diopside and mixtures thereof which comprises preparing a mixture of grains having a maximum particle size of about 0.5 mm. with not more than about 10% by weight of said grains having a particle size above 0.2 mm. of basic materials consisting essentially of a member selected from the group consisting of calcium oxide and a mixture of calcium oxide with up to an equimolar proportion of magnesium oxide, and silica in an amount of from 4 to 15% by weight in excess of the stoichiometric amount necessary to produce said synthetic material, the impurities in said basic materials consisting essentially of aluminum oxide and iron oxide in a total amount of less than 1.0% and alkalis in an amount of less than 0.1%, both related to the produced synthetic material, and sintering said mixture free from fluxing agents and without prior compacting at a temperature of from about 1200° to 1500°C. for a time sufficient to substantially completely sinter and convert said basic materials to said synthetic material substantially free from free calcium oxide, free magnesium oxide, dicalcium silicate and dimagnesium silicate.

3,926,648

SINTERED CORDIERITE GLASS-CERAMIC BODIES

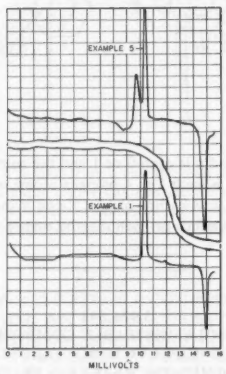
David M. Miller, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed June 7, 1974, Ser. No. 477,197

Int. Cl.² C03C *3/22*

U.S. Cl. 106—39.6 **2 Claims**

1. A sintered glass-ceramic body containing hexagonal cordierite as the crystalline phase, exhibiting a coefficient of thermal expansion (25°–1000°C.) between about 13–18 × 10^{-7}/°C., and demonstrating a use temperature up to 1300°C. consisting essentially, by weight on the oxide basis, of about



11–16.5% MgO, 31–41% Al_2O_3, 47–55% SiO_2, and 0.5–2.5% K_2O and/or Cs_2O.

3,926,649

BOROSPHOSPHATE GLASS COMPOSITIONS WITH HIGH WATER RESISTANCE AND LOW SOFTENING POINT

Neil Hunter Ray; John Nicholas Clayton Laycock, and William Derek Robinson, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 293,538, Sept. 29, 1972, abandoned. This application Mar. 3, 1975, Ser. No. 554,693

Claims priority, application United Kingdom, Oct. 15, 1971, 48105/71

Int. Cl.² C03C *3/16*

U.S. Cl. 106—47 R **9 Claims**

1. Inorganic oxide glasses having the following compositions

(mole% P_2O_5 + B_2O_3) − 75 ± 2.5

at least one oxide selected from alkali metal oxides alkaline earths and zinc oxide − 25 ± 2.5,

the total of the foregoing components being at least 99 mole % of the total composition, excluding water, and the molar ratio P_2O_5 : B_2O_3 being from 15:1 to 6:1, wherein said glasses have a transformation temperature between 125° and 225°C. and a water solubility between 0.0 and 5.5% per minute at 100°C.

3,926,650

FOAMING AGENT FOR PLASTER AND CEMENT COMPOSITIONS

Jost Lange, Naurod; Gerhart Schneider, Frankfurt am Main, and Albert Zeh, Niederwalluf, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 199,302, Nov. 16, 1971, abandoned. This application Feb. 26, 1974, Ser. No. 445,980

Claims priority, application Germany, Nov. 16, 1970, 2056255

Int. Cl.² C04B *7/02*

U.S. Cl. 106—90 **2 Claims**

1. A foamable composition comprising water, calcined gypsum or hydraulic cement and, as a foaming agent, about 0.01 to 5 parts by weight per 100 parts by weight of calcined gypsum or hydraulic cement, of the sodium salt of an α-olefin sulfonate of an olefin having 14 to 20 carbon atoms in the molecule.

3,926,651

METHOD AND APPARATUS FOR USE IN FIRING RAW MATERIAL FOR CEMENT

Yoshihiro Ichikawa; Tetsuo Fujisawa, both of Nishinomiya, and Yoshiro Seo, Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Dec. 5, 1973, Ser. No. 421,804
Claims priority, application Japan, Dec. 8, 1972, 47-123069
Int. Cl.² C04B 7/44
U.S. Cl. 106—100 4 Claims

1. A method for use in firing raw material for use in the production of cement, utilizing a combination of a counter-flow type preheating device with an upwardly divergent configuration for preheating raw material of cement, a rotary kiln for firing the raw material preheated in said preheating device and a cooling device for cooling burnt clinker produced as the result of firing the preheated raw material in said rotary kiln, in which air acts as a coolant in a cooling device and is subsequently heated, comprising the steps of:

withdrawing and further heating said heated air from said cooling device;

mixing said further heated air with hot gas being directly exhausted from said rotary kiln, thereby adjusting the temperature of said mixed gas being so formed so as to be higher than that of the raw material heated in said preheating device;

introducing said mixed gas into the bottom of said upwardly divergent preheating device in an ascending manner;

feeding powdery raw material into said preheating device from above so as to flow downwardly in a counter-flow manner with respect to said ascending mixed gas; and

supplying fuel into said preheating device to burn the same with said mixed gas, whereby coment raw material in a powder form flowing therein and carried on the gas flow therein may be calcinated and caused to flow downwardly against the ascending flow of said mixed gas for being fed into said rotary klin.

3,926,652

PERLITE ACETYLENE CYLINDER FILLER COMPOSITION

Willie J. Sisco, Jr., Southaven, Miss.; Cecil L. Long, West Memphis, Ark., and James M. Kifer, Memphis, Tenn., assignors to Coyne Cylinder Company, South San Francisco, Calif.

Filed Apr. 26, 1974, Ser. No. 464,380
Int. Cl.² C04B 13/12, 15/06, 21/00
U.S. Cl. 106—118 8 Claims

1. In an acetylene container filler composition consisting essentially of lime, perlite, fibrous asbestos, and water, the improvement wherein substantially all of said perlite is of a particle size which passes through a 16 mesh screen.

3,926,653

METHOD OF BUILDING AND MAINTAINING SLURRY CONSISTENCY

Richard F. Shannon, Lancaster, and Jerry L. Helser, Hebron, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 21, 1974, Ser. No. 444,460
Int. Cl.² C04B 1/00
U.S. Cl. 106—119 7 Claims

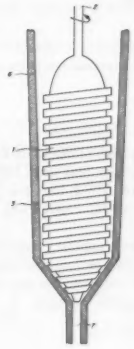
1. A method of building and maintaining the consistency of a hydrous calcium silicate insulation product forming aqueous slurry of calcareous and siliceous materials stabilized with reinforcing fibers, the method comprising allowing the slurry to quiesce for a period of time ranging from 15 to 30 minutes after initial formation of the slurry, and then subjecting the slurry to alternate periods of mixing and quiescing wherein, in the alternate periods of mixing and quiescing, each mixing period ranges from 30 seconds to 10 minutes and each quiescing period ranges from 20 minutes to 2 hours.

3,926,654

METHOD OF PREPARING A POLYPHASE SYSTEM

Frans Henri Claes, Edegem, Belgium, assignor to Agfa-Gevaert, Mortsel, Belgium

Division of Ser. No. 129,664, March 31, 1971, Pat. No. 3,801,326. This application Nov. 7, 1973, Ser. No. 413,458
Claims priority, application United Kingdom, Apr. 3, 1970, 15948/70
Int. Cl.² G03C 1/02; C09H 11/00
U.S. Cl. 106—137 8 Claims



1. A method of preparing an aqueous dispersion of a water-immiscible solvent-soluble organic polymer by mixing together (a) a solution of said polymer in a water-immiscible organic solvent and (b) an aqueous liquid, said method comprising the steps of simultaneously and continuously introducing said solution and said liquid at a substantially controlled rate into one end of an annular passageway defined by generally closely spaced surfaces of revolution, continuously removing the resultant admixture of liquids from the other end of said passageway at a rate to produce a continuous flow of said admixture through said passageway from said one end to said other end while maintaining the passageway filled with said admixture, said passageway being elongated in the general direction of said flow therethrough and gradually tapering from said one end to the other, and producing relative rotational movement between said surfaces whereby at least one of said surfaces moves substantially obliquely to the general direction of flow through said passageway, the velocity of such rotational movement being sufficient to induce a turbulent flow condition in substantially the entirety of said admixture within said passageway.

3,926,655

CLEAR PERFUMED POLYAMIDE RESIN AND METHOD OF MAKING IT

Jeffrey M. Miles, Middletown, N.Y., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 328,425, Jan. 31, 1973, abandoned. This application Sept. 23, 1974, Ser. No. 508,120
Int. Cl.² C11B 9/00; C08L 91/06
U.S. Cl. 106—243 4 Claims

1. A clear thermoplastic resin body consisting essentially of a thermoplastic polyamide resin containing about 1 to 30% perfume oil and being substantially free of cosolvent, said thermoplastic polyamide being a fatty polyamide which softens in a range of 10 to 15°C. on being heated within the range of about 100°–200°C. and has a sharp decrease in viscosity at temperatures above its softening range and which has a molecular weight within the range between about 6000 and 9000.

3,926,656

IMPROVED FLOWMOLDING COMPOSITION

John Anthony Mangels, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 30, 1974, Ser. No. 519,158
Int. Cl.[2] C08L *91/06*; C04B *35/58*
U.S. Cl. 106—272 4 Claims

1. An improved flowmolding composition which comprises:
65–77% by volume of a granular refractory material;
0.1–1.0% by volume of a deflocculant;
the remainder of volume being a 90/10 ratio by weight mixture of a 135°F melting paraffin wax and a 195°F microcrystalline wax.

3,926,657

PAPER TUBE ADHESIVE AND PAPER TUBE

William G. McConnell, P.O. Box 266, Dalton, Ga. 30720

Filed Oct. 18, 1974, Ser. No. 515,893
Int. Cl.[2] C09D *1/02*; B31C *1/00*; F16L *9/14*; C09J *1/02*
U.S. Cl. 106—286 2 Claims

1. Paper tube adhesive consisting essentially of a mixture of from 10 to 40% by weight calcium carbonate, and the remainder sodium silicate and solvent, the percentages being based upon the total weight of the mixture.

3,926,658

COATING COMPOSITION

Susan Margaret Cole; David Robert Mason, and Roger Norman Rothon, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 12, 1973, Ser. No. 369,200
Claims priority, application United Kingdom, June 22, 1972, 29335/72
Int. Cl.[2] C09K *11/30*, *11/20*
U.S. Cl. 106—287 8 Claims

1. A liquid composition comprising a mixture of an ionic aluminum compound and an ionic titanium compound dissolved in a solvent for said compounds, the ratio of aluminum: titanium in the composition being in the range 20:1 to 1:20 parts by weight of the metals and in the composition there being present phosphate ions to the extent of at least one atom of phosphorus per 20 atoms of metal.

3,926,659

IRON-CONTAINING MICA FLAKE PIGMENTS

Horst Bernhard; Reiner Esselborn; Reiner Hesse, and Horst Russmann, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Germany

Filed Mar. 15, 1974, Ser. No. 451,387
Claims priority, application Germany, Mar. 17, 1973, 2313331
Int. Cl.[2] C09C *1/00*
U.S. Cl. 106—291 31 Claims

1. A mica flake pigment of improved lightfastness consisting essentially of translucent mica flakes coated with a coating comprising up to 90% of the weight of the pigment of a continuous uniform layer of up to 500 nm thickness consisting of one only of α-, β- or γ-FeOOH or magnetite.

3,926,660

TITANIUM DIOXIDE PIGMENT COATED WITH LAYERS OF ALUMINUM OXIDE AND METAL PHOSPHATE

Bernd Holle, and Gerhard Winter, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 24, 1973, Ser. No. 409,212
Claims priority, application Germany, Nov. 15, 1972, 2255826
Int. Cl.[2] C09C *1/36*
U.S. Cl. 106—300 7 Claims

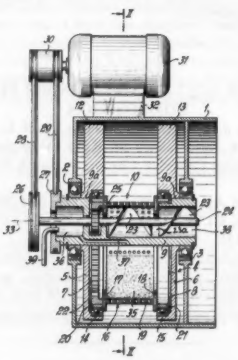
1. In the production of a non-aftercalcined titanium dioxide pigment of high greying stability when used in resin compositions, wherein the pigment is suspended in an aqueous medium, aluminum oxide and a metal phosphate are precipitated onto said pigment from the aqueous medium, the pigment is separated from the medium, washed and dried, the improvement which comprises effecting the precipitation by including in the aqueous medium a basic aluminum salt selected from the group consisting of a nitrate, chloride or mixtures thereof, adding alkali thereby to precipitate aluminum oxide onto the pigment as a layer of aluminum oxide aquate, and thereafter adding to the solution a water-soluble phosphate and a soluble compound of a metal having a valence of at least two, the phosphate of said metal being colorless and water insoluble, thereby to precipitate on said pigment a metal phosphate.

3,926,661

CENTRIFUGE CONSTRUCTION

Werner Steprath, Gohr, Germany, assignor to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft, Grevenbroich, Germany

Filed Feb. 1, 1974, Ser. No. 438,606
Claims priority, application Germany Feb. 3, 1973, 2305326
Int. Cl. B04b *5/00*, *9/08*; C13f *1/06*
U.S. Cl. 127—19 10 Claims



1. In a centrifuge, a combination comprising a rotor mounted for rotation about a first axis; a screen drum mounted on said rotor for rotation about a second axis parallel to but laterally offset from said first axis; a conveying screw mounted in said screen drum for rotation jointly with said rotor about said first axis, said conveying screw having screw flights which extend close to an inner circumferential surface of said screen drum; drive means for rotating said screen drum at a first circumferential speed, and for rotating said rotor and conveying screw at a different second circumferential speed; and admitting means for admitting a liquid-containing mass into said screen drum, so that during centrifuging the liquid can escape from the latter whereas the retained centrifuged material forms on said inner circumferential surface which, due to the difference between said first and second speeds, moves incrementally towards said conveying screw for engagement by the same and conveyance out of said screen drum.

3,926,662
PRODUCTION OF CANE SUGAR

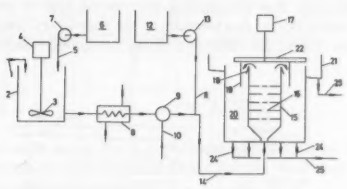
John Trethowan Rundell, Keston, and Paul Richmond Pottage, Bromley, both of England, assignors to Tate & Lyle Limited, London, England

Continuation-in-part of Ser. No. 263,784, June 19, 1972, Pat. No. 3,853,616. This application Sept. 23, 1974, Ser. No. 508,195

Claims priority, application United Kingdom, Sept. 28, 1973, 45516/73

Int. Cl.² C13D *3/00*

U.S. Cl. 127—48 **10 Claims**



1. In a process for removing suspended solid impurities from a calcium-containing sugar liquor selected from the group consisting of cane sugar evaporated juice and cane sugar affination syrup, which comprises: forming therein an insoluble calcium phosphate primary floc containing said suspended impurities; aerating the liquor containing the primary floc, with agitation; distributing uniformly throughout the aerated liquor from 1 to 40 parts by weight of anionic flocculating agent per million parts by weight of sugar in the liquor, to initiate the formation of a secondary floc therein, retaining the resulting mixture for from 15 seconds to 5 minutes in a flocculator vessel with non-turbulent agitation preventing the segregation of the secondary floc from the liquor and allowing the secondary floc to grow; transferring the liquor containing the secondary floc with minimal agitation and shear from the flocculator vessel to a separator vessel; allowing the secondary floc to segregate by flotation from the liquor in the separator vessel; and separately removing clarified liquor and flocculated solids from the separator vessel; the improvement which comprises forming said insoluble calcium phosphate primary floc by adding a soluble phosphate salt to said sugar liquor and employing as said anionic flocculating agent a polymer with a molecular weight of from one million to ten million containing from 50 to 80 mole percent of acrylamide units and from 50 to 20 mole percent of anionic units selected from the group consisting of acrylic acid and acrylate units.

3,926,663
METHOD AND APPARATUS FOR SCRUBBING THE ENDS AND SIDES OF A MOTOR VEHICLE

James H. Gray, 3411 E. Gold Dust Ave., Phoenix, Ariz. 85028

Filed Oct. 11, 1973, Ser. No. 405,329

Int. Cl.² B08B *1/02*

U.S. Cl. 134—6 **8 Claims**

1. A method for scrubbing the front, rear and side surfaces of a vehicle as it moves relative to a washing installation, said installation having first and second pairs of independently pivoted side mounted brushes, said method including the sequentially initiated steps of:

a. engaging each side surface of said vehicle with one brush in said first pair of brushes;

b. transposing each brush in said first pair of brushes along the corresponding side surface of said vehicle from the front surface of said vehicle to the rear surface of said vehicle;

c. engaging the front surface of said vehicle with said second pair of brushes;

d. transposing each brush in said second pair of brushes across the front surface of said vehicle:

i. from one side of the vehicle to at least the center of said vehicle and thereafter

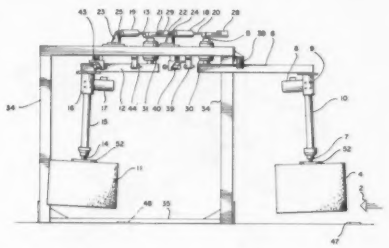
ii. from the center of said vehicle back to the side of said vehicle;

e. engaging each side surface of said vehicle with one brush in said second pair of brushes;

f. transposing each brush in said second pair of brushes along the corresponding side surface of said vehicle from the front surface of said vehicle to the rear surface of said vehicle;

g. engaging the rear surface of said vehicle with said first pair of brushes;

h. transposing each brush in said first pair of brushes across the rear surface of said vehicle:



i. from one side of the vehicle to at least the center of said vehicle and thereafter;

ii. from the center of said vehicle back to the side of the said vehicle.

6. Apparatus for scrubbing the front, rear and side surfaces of a vehicle as the vehicle moves through a path relative to a washing installation, said apparatus comprising in combination:

a. a first pair of brushes for scrubbing the opposite side surfaces and the rear surface of said vehicle;

b. a first pair of unitary support arms for separately mounting each brush in said first pair of brushes for independent pivotal translation through the path of said vehicle;

c. a second pair of brushes for scrubbing the front surface and the opposite side surfaces of said vehicle;

d. a second pair of unitary support arms for separately mounting each brush in said second pair of brushes for independent translation through the path of said vehicle;

e. means for engaging each side surface of said vehicle with one brush in said first pair of brushes;

f. means for transposing each brush in said first pair of brushes along the corresponding side surface of said vehicle from the front surface of said vehicle to the rear surface of said vehicle;

g. means for engaging the front surface of said vehicle with said second pair of brushes;

h. means for transposing each brush in said second pair of brushes across the front surface of said vehicle: (i) from one side of the vehicle to at least the center of said vehicle and thereafter, (ii) from the center of said vehicle back to the side of said vehicle;

i. means for engaging each side surface of said vehicle with one brush in said second pair of brushes;

j. means for transposing each brush in said second pair of brushes along the corresponding side surface of said vehicle from the front surface of said vehicle to the rear surface of said vehicle;

k. means for engaging the rear surface of said vehicle with said first pair of brushes;

l. means for transposing each brush in said first pair of brushes across the rear surface of said vehicle:

i. from one side of the vehicle to at least the center of said

vehicle and thereafter;

ii. from the center of said vehicle back to the side of said vehicle;

whereby the front, rear and side surfaces of said vehicle are at least twice subjected to brushing while said vehicle only once passes said washing installation.

3,926,664
METHOD FOR DEAERATING A CIRCUIT FOR THE TRANSPORT OF LIQUIDS

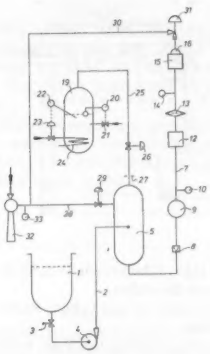
Jan Baptist Verreydt, Edegem, Belgium, assignor to Agfa-Gevaert, a naamloze vennootschap, Mortsel, Belgium

Filed Aug. 30, 1973, Ser. No. 393,210

Claims priority, application United Kingdom, Aug. 31, 1972, 40476/72

Int. Cl.² B08B *5/04*

U.S. Cl. 134—21 **7 Claims**



1. Method for deaerating a circuit for the transport of liquids, in particular of photographic suspensions, comprising the steps of:

a. establishing a reduced pressure in said circuit for rarefying air or other gases present therein,

b. producing a saturated vapor at a pressure which is higher than said reduced pressure under (a) but lower than the atmospheric pressure, and passing a current of said vapor through said circuit for expelling said rarefied air or other gases from said circuit, and

c. thereafter pumping a deaerated liquid through the circuit for expelling the vapor therefrom.

3,926,665
METHOD AND APPARATUS FOR COLLECTING FIBER WASTE FROM OPEN-END SPINNING MACHINES

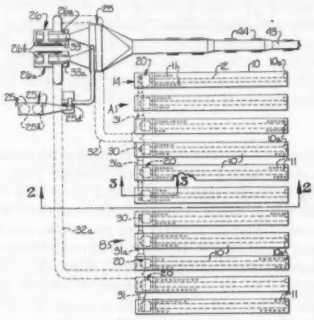
John Harrap, Prestbury, and Richard Gordon Stewart, Heaton Mersey, both of England, assignors to Parks-Cramer (Great Britain), Ltd., Oldham, England

Continuation-in-part of Ser. No. 366,963, June 4, 1973, abandoned. This application Oct. 24, 1973, Ser. No. 409,055

Int. Cl.² B08B *5/04*; A62C *1/00*; D01H *7/00*

U.S. Cl. 134—18 **33 Claims**

1. A method of collecting fiber waste generated as an incident of the operation of a plurality of rotor-type spinning units of each of a plurality of open-end spinning machines while normally maintaining adequate spinning air flow therethrough, and for preventing a conflagration in the event of a fire in the fiber waste being collected, said method comprising effecting a suction spinning air flow at the spinning units of each machine and into a respective duct communicating therewith by producing a suction airstream at an area downstream of and communicating with all of the respective ducts so that air flows along the ducts toward such area and through a separate primary filter for each duct, while entrapping fiber waste from the spinning units against the respective primary filters, periodically dislodging the entrapped fiber waste from the primary filters and causing the fiber waste being dislodged to be entrained in the air flow downstream of each respective primary filter, directing the thus dislodged and entrained fiber waste downstream to and against the upstream side of a secondary filter common to and downstream of all of the primary filters as the air flows through the secondary filter, removing the collected fiber waste from the secondary filter, sensing the occurrence of a fire in the fiber waste while it is being entrapped by any of the primary filters and in response thereto interrupting the air flow through the duct and the primary filter of the respective machine without interrupting the air flow through the ducts and primary filters of the remaining machines so that the burning fiber waste will be prevented from being borne downstream to the secondary filter by the air flow during the operation of the remaining machines.



11. A method of collecting fiber waste generated as an incident of the operation of a plurality of rotor-type yarn spinning units of each of a plurality of open-end spinning machines, said method comprising effecting a suction spinning air flow at the spinning units of each machine and into a respective duct communicating therewith by producing a suction airstream at an area downstream of and communicating with all of the respective ducts so that air flows along the ducts toward such area and through a separate primary filter for each duct, while entrapping fiber waste from the spinning units against the respective primary filters, periodically dislodging the entrapped fiber waste from the primary filters and causing the fiber waste being dislodged to be entrained in the airflow downstream of each respective primary filter without significant reduction in the spinning air flow, directing the thus dislodged and entrained fiber waste downstream to and against the upstream side of a secondary filter common to and downstream of all of the primary filters as the air flows through the secondary filter, and removing the collected fiber waste from the secondary filter.

3,926,666
METHOD AND APPARATUS FOR CLEANING AND PLATING ARTICLES WITHIN A PLURALITY OF ROTATING BARRELS

Robert McInnes, Flint, Mich., assignor to Harry P. Bowman; Clifford J. Millhouse and Russell E. Bowers, all of Flint, Mich., part interest to each

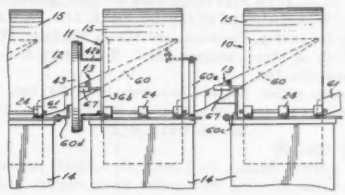
Division of Ser. No. 252,313, May 10, 1972, Pat. No. 3,855,107, which is a continuation-in-part of Ser. No. 89,409, Nov. 13, 1970, abandoned. This application Aug. 29, 1973, Ser. No. 392,479

Int. Cl.² B08B *3/04*

U.S. Cl. 134—25 R **53 Claims**

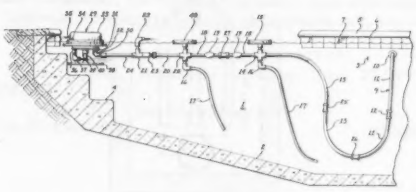
1. The method of cleaning and plating articles which comprises

providing a plurality of separate substantially identical containers adapted to contain liquid treating material,
providing a barrel in partially submerged relation to the liquid in each said container,
supporting each said barrel rotatably about a fixed generally horizontal axis so that a portion of the barrel is submerged in the liquid in its respective container,
each said barrel having both ends open and having a plurality of baffles on the inner periphery thereof,



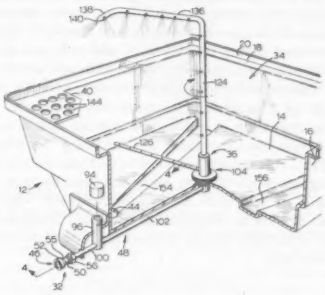
rotating each barrel for a predetermined interval of time individual to said barrel in one direction such that the baffles agitate the articles,
thereafter rotating each said barrel in the opposite direction to cause said baffles to elevate the articles and permit them to fall solely by gravity freely downwardly,
and providing a fixed guide path from the interior of one said barrel to the interior of a successive barrel for receiving the articles falling by gravity and thereby guiding the articles as they move solely by gravity during the rotation of said barrel in said opposite direction into the succeeding barrel.

3,926,667
POOL CLEANING APPARATUS
Michael C. Gibellina, Scottsdale, Ariz., assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Jan. 7, 1974, Ser. No. 431,023
Int. Cl.[2] B08B *9/08*
U.S. Cl. 134—167 R **18 Claims**



12. A swimming pool cleaning apparatus for washing the bottom and side walls of a pool that includes a water supply outlet disposed in one of its side walls, said apparatus comprising, a buoyant cleaning head movable about the surface of water within the pool and including a water manifold for receiving and distributing a flow of water; hose means operatively connectable to the water supply outlet of the pool for supplying a flow of water under pressure to said water manifold, said hose means including means for connecting the hose in fluid communication to the manifold and means for allowing relative horizontal movement between the hose and manifold; first jet means on said hose, upstream of said means for allowing horizontal movement, for forming a first water jet from water flowing in said hose; second jet means operatively associated with said manifold for forming a second jet of water from water under pressure in said manifold, said first and second jets being normally located in a predetermined angular relation to each other to produce a combined reaction force propelling said cleaning head forwardly along and laterally against the sidewalls of the pool; said means for allowing horizontal movement allowing the angular relation of said jet means to be varied under the influence of said first jet means should forward movement of the cleaning head become stalled, thereby to change the angle at which the combined reaction force is applied to the cleaning head and unstall the head.

3,926,668
WATER POWERED DISHWASHER
Jack Ross, 230 Richmond St. East, Toronto 2, Ontario, Canada
Filed May 2, 1974, Ser. No. 466,198
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—179 **10 Claims**



1. A water-powered dishwasher comprising a container shell, a top adapted to seat on said container shell to define therewith a washing cavity within said shell and top; water inlet and outlet means, a portion of said water inlet means extending into the washing cavity and being secured by securing means adjacent the bottom of the container shell in substantially perpendicular relation to said bottom at all times to discharge a column of water substantially perpendicular to said bottom proximate the center thereof through a first aperture disposed proximate the upper end of said portion of the water inlet means extending into the washing cavity and a laterally directed stream of water through at least one second aperture of lesser cross-sectional area than the water column, disposed in said portion of the water inlet means below said first aperture; rotatable spray means, having a housing at the base thereof of an internal surface configuration to seat over at least a portion of the outer surface of said portion of the water inlet means in substantially perpendicular relation to said bottom, secured for rotation about said portion by retaining means extending through the housing of the rotatable spray means to ride in a channel substantially parallel to the bottom of the container in the outer wall of said portion, the portion of the retaining means which projects into the channel having a smooth surface to contact a downwardly facing ledge defining the upper extent of said channel to act as a thrust bearing thereagainst when the rotatable spray means and therefore the retaining means is moved upwardly by the force of the column of water discharged, the housing of said rotatable spray means having a lower tube disposed substantially parallel to the bottom of said container shell and in communication with said at least one second aperture to receive a flow of water therefrom; said lower tube having apertures disposed in the wall of said tube to effect outflow of jets of water therefrom, each jet having horizontal and vertical force components; said rotatable spray means further comprising a perpendicularly disposed tube relative to said container shell bottom and in communication with said first aperture to receive said column of water and to discharge the water through apertures in the wall of said tube as jets of water, each jet having at least a horizontal force component.

3,926,669

ELECTROCHEMICAL CELLS HAVING AN ELECTROLYTIC SOLUTION COMPRISING A COVALENT INORGANIC OXYHALIDE SOLVENT

James J. Auborn, Groton, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. Nos. 305,811, Nov. 13, 1972, abandoned, and Ser. No. 305,812, Nov. 13, 1972, abandoned. This application Aug. 2, 1973, Ser. No. 385,127

Int. Cl. H01m *17/00*

U.S. Cl. 136—6 LN 15 Claims

1. An electrochemical cell consisting essentially of an oxidizable active anode material; a solid, non-consumable, electrically conducting, inert cathode current collector selected from the group consisting of the alkaline earth metals, the Group III A metals, the Group IV A metals, the Group V A metals, the transition metals, the rare earth metals, and semiconductors; said anode material being more electropositive than said cathode current collector and thus said anode material is oxidized during operation of said cell; and an electrolytic solution between and in contact with said anode and said cathode current collector, said electrolytic solution consisting essentially of a liquid, electrochemically reducible, covalent inorganic oxyhalide or thiohalide solvent and a solute dissolved therein, said inorganic solvent being the sole oxidant material and sole solvent material in said electrolytic solution; said inorganic solvent being electrochemically reduced upon the surface of said cathode current collector, whereby said inorganic solvent in conjunction with said oxidizable anode material serves as a source of electrical energy during operation of said cell.

3,926,670

LEAD-ACID STORAGE BATTERY PASTE

Dale F. Taylor, Schenectady, and Erwin G. Siwek, Ballston Spa, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 23, 1973, Ser. No. 408,298

Int. Cl.² H01M *4/36*

U.S. Cl. 136—26 6 Claims

1. A battery lead oxide mixture adapted to form a cohesive paste for use in the preparation of lead-acid storage batteries comprising at least one battery lead oxide and lithium sulfate.

3,926,671

METHOD OF MANUFACTURING POSITIVE NICKEL HYDROXIDE ELECTRODES

Manfred A. Gutjahr, Wendlingen (Neckar), Germany; Rudolf Schmid, Vienna, Austria, and Klaus D. Beccu, Geneva, Switzerland, assignor to Battelle Memorial Institute, Switzerland

Filed June 5, 1974, Ser. No. 476,724

Claims priority, application Switzerland, June 7, 1973, 8239/73

Int. Cl.² H01M *43/04*

U.S. Cl. 136—29 11 Claims

1. A method of manufacturing a positive storage battery electrode having an active mass of nickel hydroxide incorporated in a consolidated, porous, nickel electrode support, comprising the steps of:

a. intimately contacting a highly porous, fibrous or open-pore reticular, organic core structure, having a large internal surface, with a mass of dry powder particles consisting essentially of nickel and having a mean grain size less than 10 microns, so that said particles are brought into contact with said internal surface and adhere thereon to form a substantially uniform powder coating covering the organic core structure;

b. subjecting the resulting powder-coated organic core structure to a thermal treatment such as to cause sintering of the particles of said powder coating, with removal of the underlying organic core structure, so as to thereby produce a strongly consolidated nickel electrode support structure having substantially the same structure and porosity as the said organic core structure; and

c. incorporating the active electrode mass in the resulting nickel support structure by depositing nickel hydroxide in the pores thereof.

3,926,672

REACTIVE MIXTURE FOR FABRICATING AMALGAMALED CHLORIDE FREE ZINC ANODE

Edward J. Curelop, Brockton, and Nikola Marincic, Winchester, both of Mass., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Division of Ser. No. 114,349, Feb. 10, 1971, Pat. No. 3,713,891. This application Oct. 20, 1972, Ser. No. 299,529

Int. Cl. H01m *43/02*

U.S. Cl. 136—30 2 Claims

1. A reactive mixture for fabricating a highly porous amalgamated chloride free zinc anode for a current producing device, said mixture consisting essentially of zinc powder, mercuric oxide, and a chloride free filler material which is selected from the group consisting of sodium acetate, sodium borate and sodium oxalate.

3,926,673

METHOD AND APPARATUS FOR CHARGING ZINC ELECTRODES IN GALVANIC CELLS

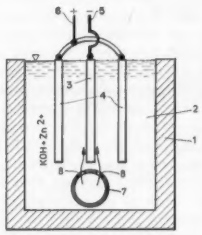
Nikolaus Saridakis, Braunschweig, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed July 29, 1974, Ser. No. 492,694

Claims priority, application Germany, Aug. 23, 1973, 2342579

Int. Cl.² H01M *41/00*

U.S. Cl. 136—31 9 Claims



1. A process for charging a zinc electrode utilized as an anode immersed in a zinc-containing electrolyte in a galvanic cell, comprising the steps of:

a. applying a voltage to the zinc electrode; and

b. simultaneously flushing the surface of said zinc electrode with a gaseous agent that is introduced from outside the galvanic cell.

5. Apparatus for charging a zinc electrode utilized as an anode immersed in a zinc-containing electrolyte in a galvanic cell, said apparatus comprising, in combination:

a. means for applying a voltage to said zinc electrode;

b. source means for supplying a gaseous agent to the galvanic cell from outside the cell; and

c. means, connected to said source means, for flushing the surface of said zinc electrode with said gaseous agent.

3,926,674

METHOD OF MANUFACTURING ELECTRICAL CONNECTION ELEMENTS FOR SUPPORTING ELECTRODES FOR STORAGE CELLS

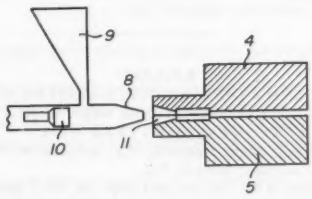
Pierre Jonville; Helmut Stöhr, both of Plan-les-Ouates, Geneva; Klaus D. Beccu, Troinex, Geneva, and René Baronnet, Grand-Lancy, Geneva, all of Switzerland, assignors to Battelle Memorial Institute, Switzerland

Filed Feb. 12, 1974, Ser. No. 441,853

Claims priority, application Switzerland, Feb. 12, 1973, 1959/73; June 18, 1973, 8848/73

Int. Cl.² H01M 35/08

U.S. Cl. 136—36 4 Claims



1. A method of forming electrical connecting members having a desired configuration and forming an integral part of a felted fiber-glass electrode support structure comprising, providing a felt of glass fibers to function as an electrode support, and locally injecting molten lead or lead alloy under pressure into said fiber-glass structure within a given zone thereof in a desired configuration to simultaneously form and incorporate a desired connecting member in said support structure.

3,926,675

PROCESS FOR MAKING ELECTRODES CONTAINING RANEY NICKEL AND A THIOCYANATE

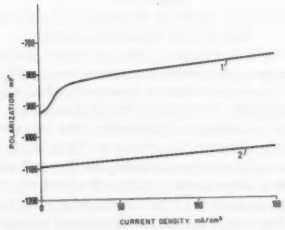
Hans Kohlmüller, and Gerlind Kohlmüller, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 17, 1973, Ser. No. 397,923

Claims priority, application Germany, Sept. 27, 1972, 2247391

Int. Cl. H01m 27/08

U.S. Cl. 136—86 E 9 Claims



1. In a process of generating electricity in a fuel cell wherein the fuel comprises hydrazine, the improvement of employing a fuel electrode comprising Raney nickel and an alkali metal thiocyanate in the amount of between about 5 to 25 weight % based on said nickel.

3,926,676

BATTERY COMPRISING A PLURALITY OF CELLS

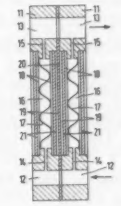
Wolfgang Frie; Burghard Grave; Karl Strasser, and Heinrich Gutbier, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Gerlin, Erlangen, Germany

Continuation of Ser. No. 227,948, Feb. 22, 1972, abandoned. This application Feb. 11, 1974, Ser. No. 441,339

Claims priority, application Germany, Feb. 25, 1971, 2109034

Int. Cl.² H01M 4/86

U.S. Cl. 136—86 R 5 Claims



1. In a battery utilizing an electrolyte, comprising means defining a plurality of tightly interconnected electrochemical cells or water removal cells, each of said cells having an elec trolyte chamber connected to a supply passage and a discharge passage, a main inlet channel communicating with each of said supply passages, a main outlet channel communicating with each of said discharge passages whereby electrolyte flow is effected in parallel to each of said electrolyte chambers; said main inlet channel and said main outlet channel each having a constant uniform cross-sectional area along its length, said main outlet channel having a larger cross-sectional area than said main inlet channel, so that substantially the same operational pressure difference prevails between the supply passage and the respective discharge passage of each of said electrolyte chambers.

3,926,677

ELECTRIC PRIMARY CELLS

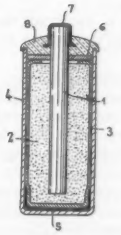
Jean-Yves Machat, Grenoble, and Jean-Claude Sohm, La Tronche, both of France, assignors to Anvar, Agence National de Vaolirsation de la Recherche, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 333,322, Feb. 6, 1973, abandoned. This application Oct. 11, 1974, Ser. No. 514,167

Claims priority, application France, Feb. 25, 1972, 72.06464

Int. Cl.² H01M 21/00

U.S. Cl. 136—107 4 Claims



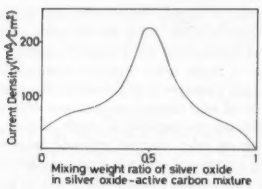
1. A primary electric cell which can be fully sealed because of negligible quantity of gas evolved, comprising:

a. a solid anode consisting essentially of zinc;
b. an uncorrodible cathode;
c. a paper separator in direct contact with the zinc anode;
d. a depolarizor of mercuric oxide and carbon black operatively associated with said cathode;
e. an electrolyte interposed between the cathode and the paper separator and in direct contact with the paper, the electrolyte consisting essentially of an aqueous solution of zinc perchlorate containing zinc oxide or zinc hydroxide in quantity sufficient to minimize the corrosive effect on the anode of the electrolyte; and
f. means for sealing the cell gas-tight.

3,926,678
METHOD OF MANUFACTURING FUEL CELL ELECTRODES

Takashi Tsuchida, Shizuoka; Kenichi Shinoda, Aichi; Kohei Yamamoto, Shizuoka; Tomoya Murata, Shizuoka, and Yoshihiro Maeda, Shizuoka, all of Japan, assignors to Fuji Electrochemical Co., Ltd., Tokyo, Japan

Filed July 2, 1973, Ser. No. 375,830
Claims priority, application Japan, Aug. 31, 1972, 47-86669
Int. Cl. H01m *13/04*
U.S. Cl. 136—122 **3 Claims**



1. A method of manufacturing an electrode for a fuel cell comprising the steps of kneading a mixture of silver oxide powder and active carbon powder with a water-repellent binder, the weight ratio of said silver oxide powder to said active carbon powder being within a range of 1:2 to 2:1, molding the kneaded mixture to a thin layer to produce a thin catalyst layer, heating said thin catalyst layer under pressure using a heating temperature of 300°C to 400°C to effect drying and activation of the catalyst simultaneously, and integrating said thin catalyst layer with a metallic collector net and a gas-permeable film by the application of heat and pressure.

3,926,679
PHENOLIC RESIN AND BATTERY SEPARATOR IMPREGNATED THEREWITH

Robert T. Jones, Pelham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 9, 1974, Ser. No. 432,111
Int. Cl.² H01M *2/14*
U.S. Cl. 136—146 **11 Claims**

1. A cellulosic permeable battery separator which comprises a cellulosic substrate thoroughly impregnated with a resin composition to impart improved oxidation resistance, wherein the resin composition comprises a resole of number average molecular weight in the range of 130 to 300 and an aldehyde to phenol molar ratio in the range of 1.94 to 2.45 and an anti-migratory agent for reducing the degree of migration of the resin composition in the cellulosic substrate during drying and curing, wherein the anti-migratory agent is selected from the group consisting of ethylene glycol, glycerol, and sorbitol, wherein the weight ratio of resole to anti-migratory agent is in the range of 100:7 to 100:32, and wherein the resole is advanced to an infusible state.

3,926,680
PRIMARY MAGNESIUM ELEMENT

Jakob Bauer, Ellwangen, and Winfried Krey, Neunheim, Kr. Aalen, both of Germany, assignors to Varta Batterie AG, Germany

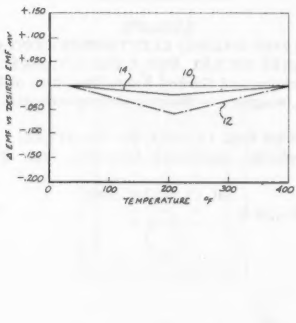
Filed Jan. 21, 1974, Ser. No. 435,191
Claims priority, application Germany, Jan. 19, 1973, 2302469
Int. Cl.² H01M *6/04*
U.S. Cl. 136—154 **7 Claims**

1. In a primary galvanic element comprising conventional components including a chromate inhibitor the electrolyte which comprises concurrently, as a chromate buffer system, barium, strontium, chromate and sulphate ions in equilibrium with solid phase barium chromate, barium sulphate and strontium sulphate.

3,926,681
TYPE R AND S THERMOCOUPLE SYSTEMS HAVING COPPER-NICKEL-MANGANESE WIRE AS PLATINUM COMPENSATING LEAD WIRE

Teh Po Wang, North Caldwell, N.J., assignor to Wilbur B. Driver Company, Newark, N.J.

Continuation of Ser. No. 293,063, Sept. 28, 1972, abandoned, which is a division of Ser. No. 129,460, March 30, 1971, which is a continuation-in-part of Ser. No. 822,786, April 1, 1969, abandoned. This application Dec. 10, 1973, Ser. No. 423,267
Int. Cl.² H01L *35/20*
U.S. Cl. 136—241 **1 Claim**



1. A thermocouple system consisting essentially of a positive thermal element consisting essentially of an alloy of platinum and rhodium, a negative thermal element consisting essentially of platinum, said positive and negative thermal elements being electrically joined to form a thermocouple selected from the group consisting of Type R and Type S thermocouples, wherein the positive thermal element of said Type R thermocouple is a platinum rhodium alloy containing 13 percent rhodium, balance platinum and wherein the positive thermal element of said Type S thermocouple is a platinum rhodium alloy containing 10 percent rhodium, balance platinum, a positive lead wire consisting essentially of copper, electrically connected to said positive thermal element and a negative lead wire of an alloy consisting essentially of 0.5 percent to 1.5 percent nickel, 0.25 percent to 0.40 percent of manganese, balance copper, said negative lead wire being electrically connected to said negative thermal element.

3,926,682

METHOD FOR PRODUCING SOLID MATERIAL HAVING AMORPHOUS STATE THEREIN

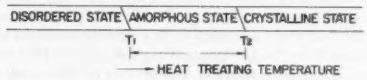
Toshikazu Shimada, Tokyo; Kiichi Komatsubara, Tokorozawa; Susumu Hasegawa, Aomori, and Yoshiki Kato, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 15, 1974, Ser. No. 514,926

Claims priority, application Japan, Oct. 17, 1973, 48-115811; May 22, 1974, 49-56570

Int. Cl.² H01L *21/263*

U.S. Cl. 148—1.5 10 Claims



1. A method for producing a solid material comprising the steps of:

irradiating a starting material with at least one beam selected from among ionic, atomic and molecular beams in excess of an amount to saturate lattice defects in said starting material at least partially into a disordered state; and

heating said starting material at a temperature higher than a transition temperature to an amorphous state, but lower than a crystallizing temperature of said starting material.

3,926,683

METHOD OF MANUFACTURING SUPERCONDUCTORS OF β-TUNGSTEN STRUCTURE

Christianus Antonius Maria van Beijnen, Alkmaar, Netherlands, assignor to Reactor Centrum Nederland (Stichting), The Hague, Netherlands

Filed Mar. 22, 1974, Ser. No. 453,952

Claims priority, application Netherlands, Apr. 9, 1973, 7304947

Int. Cl.² H01L *39/02*

U.S. Cl. 148—11.5 R 14 Claims

1. A method of manufacturing a superconductor comprising at least one wire constructed from different materials which comprises providing a hole in a bar of conductive metal, inserting a first component selected from the elements of Group VB of the Periodic Table into said hole, introducing into said first component a second component consisting essentially of an alloy or a compound of said Group VB element and an element selected from the group consisting of Group IIIA and Group IVA of the Periodic Table, and thermally treating said wire to produce a superconductor having a superconductive boundary layer.

3,926,684

HIGH CRITICAL CURRENT SUPERCONDUCTORS AND PREPARATION THEREOF

David G. Howe, Greenbelt, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 25, 1974, Ser. No. 527,000

Int. Cl.² H01L *39/00*

U.S. Cl. 148—11.5 R 6 Claims

1. A composite superconductor which comprises:

a core selected from the group consisting of a vanadium-gallium alloy with a gallium content between 8 at. percent and 12.5 at. percent, a niobium-tin alloy with a tin content between 2 and 12 at. percent, and a vanadium-silicon alloy with a silicon content between 4.5 at. percent and 10 at. percent;

a matrix selected from the group consisting of copper-gallium alloy with a gallium content from about 16 to about 22 at. percent, a copper-tin alloy with a tin content from about 1 to about 11 at. percent, a copper-silicon alloy with a silicon content from about 5 to 14 at. percent, so that the matrix alloy has the same metal solute as the core alloy; and

an intermediate layer of an A-15 compound produced by a solid state reaction between said core rod and said matrix sheath.

3,926,685

SEMI-FERRITIC STAINLESS MANGANESE STEEL

Andre Gueussier, 6 rue Claude Genoux; Roland Tricot, 14 rue du Val des Roses, and Jean Lefevre, 3 bis rue de Ripaille, all of Albertville (Savoie), France

Continuation of Ser. No. 42,037, June 1, 1970, abandoned. This application Dec. 1, 1972, Ser. No. 311,111

Claims priority, application France, June 3, 1969, 69.18142

Int. Cl. C21d *9/48*

U.S. Cl. 148—12 EA 11 Claims

1. A process for treating a semi-ferritic stainless steel having an in-use structure of alpha and delta ferrite and carbides, characterized by high strength properties, good bending characteristics, good micro-hardness, good fusion weld resilience and good corrosion resistance, both in the presence and absence of chlorine and acid media, comprising:

A. Preparing a steel having a composition selected from the group consisting of by weight 0.1% max. C, 3–6% Mn, 1% max. Si, 1% max. Ni, 18–22% Cr, 1.5% max. Mo, 1% max. Cu, 0.1% max. N_2 and the balance Fe and incidental impurities, .1% mac. C, 3–6% Mn, 1% max. Si, 1% max. Ni, 15–18% Cr, 1.5–3.0% Mo, 1% max. Cu, .1% max. N_2 and the balance Fe and other incidental impurities and 0.1% max. C, 3–6% Mn, 1–2% Si, 1% max. Ni, 15–18% Cr, 0.5–2.0% Mo, 1% max. Cu, 0.1% max. N_2 and the balance Fe and other incidental impurities, said steel characterized by chromium and nickel equivalents falling within the pentagon on the graph of the sole FIGURE, said pentagon having as its ordinates, A (15, 4.5) B (18.5, 8), C (24, 8), D (24, 6), E (20, 2);

B. Hot working said steel so as to maintain an austenite content while hot of from 10 to 50%, the balance being delta ferrite;

C. Cooling said steel to retain said austenite at room temperature;

D. Treating said steel to transform the austenite into martensite; and

E. Tempering the martensite to transform the martensite into alpha ferrite and carbides.

3,926,686

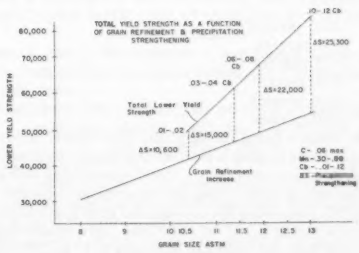
HIGH-STRENGTH LOW-ALLOY STEEL

William E. Creswick, and Patrick J. Hunt, both of Sault Sainte Marie, Canada, assignors to The Algoma Steel Corporation, Limited, Ontario, Canada

Filed Jan. 9, 1974, Ser. No. 432,030

Int. Cl.² C21D *1/02*

U.S. Cl. 148—12 F 4 Claims



1. A method of making a high strength low alloy steel strip having a minimum yield strength of 50,000 psi and good formability properties which comprises subjecting a slab of

steel having a composition consisting essentially of, by weight, 0.10 percent maximum carbon, 0.30 to 0.80 percent manganese 0.02 percent maximum sulphur, 0.02 to 0.06 percent aluminum, 0.01 to 0.02 columbium, 0.06 percent maximum cerium, the balance being iron and incidental impurities, to a hot-rolled finishing temperature in the range of 1620° to 1670°F and collecting the strip in a temperature range of 1325° to 1375°F.

3,926,687

METHOD FOR PRODUCING A KILLED STEEL WIRE ROD

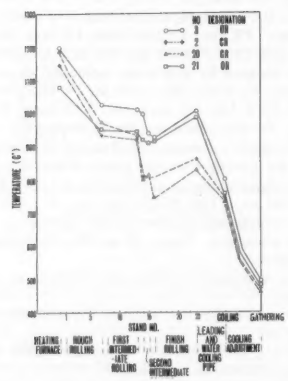
Hisashi Gondo, Kisarazu; Naoki Eguchi, Narashino; Takafumi Yoshimura, and Masaki Araki, both of Kisarazu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sept. 9, 1974, Ser. No. 504,270

Claims priority, application Japan, Sept. 10, 1973, 48-101875

Int. Cl.² C21D *7/14, 9/52*

U.S. Cl. 148—12 B **4 Claims**



1. A method for producing high tensile strength steel wire rods and bars having a basic composition comprising;

C **0.02** to **0.20** percent

Si **0.03** to **0.90** percent

Mn **1.00** to **1.85** percent

together with one or more selected from the group consisting of

Nb	0.05 percent
V	0.08 percent
Ti	0.25 percent
Zr	0.30 percent
Cr	0.40 percent
B	0.005 percent

with the balance being the iron and unavoidable impurities, which comprises heating a steel having above composition at a temperature not lower than 1,150°C, conducting intermediate rolling and/or finish rolling at a temperature between 700° and 1050°C, controlling the cooling rate from finish of the hot rolling to a coiling to 40° to 350°C/sec., and controlling the cooling rate from the coiling to gathering to 1° to 15°C/sec. to obtain hot rolled steel wire rods and bars having excellent workability and spot weldability and having a tensile strength not lower than 50 kg/mm² and a reduction of area not lower than 50 percent.

3,926,688

METHOD OF MANUFACTURING A FLAT STEEL PRODUCT HAVING AN OXIDATION-RESISTANT COATING

Roland Cesar Amand Liesenborghs, Sclessin, and Vincent Marguerite Leroy, Liege, both of Belgium, assignors to Societe Anonyme Cockerill-Ougree-Providence et Esperance-Longdoz, Seraing, Belgium

Filed Jan. 30, 1974, Ser. No. 437,917

Claims priority, application Belgium, Jan. 30, 1973, 794758

Int. Cl.² C21D *7/14*

U.S. Cl. 148—12.1 **4 Claims**

1. A method of manufacturing a steel product having an oxidation-resistant coating, comprising the steps of: depositing on a mild steel sheet a coating of an oxidation-resistant material selected from the group consisting essentially of the metals Cr, Ni, Co, and Mo, alloys of at least two of the metals with each other, and alloys of at least one of the metals with iron, the coating having an oxgen content of 1.5%; tightly winding the coated sheet to form a compact coil or stack of the coated sheet; and heat treating the compact coil or stack of the coated sheet at a temperature of 950–1300°C for ½ hour to 48 hours under a vacuum so as to cause diffusion of the sheet and coating, the vacuum being sufficient so that the coating is de-oxidized and decarburized.

3. The method as claimed in claim 1, further comprising rolling the coated sheet.

3,926,689

METHOD OF PRODUCING HOT ROLLED STEEL RODS OR BARS

Yves Jean Respen, Herstal; Paul Andre Cosse, Bellaire, and Mario Economopoulos, Liege, all of Belgium, assignors to Centre de Recherches Metallurgiques - Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Oct. 31, 1973, Ser. No. 411,227

Claims priority, application Belgium, Oct. 31, 1972, 790867

Int. Cl.² B21B *3/00*

U.S. Cl. 148—12.4 **5 Claims**

1. A process for the production of a steel rod or bar in a hot rolling mill, comprising: superficially quenching the rod or bar at the exit of a finishing stand to form bainite or martensite in the surface layer of the rod or bar, with the core of the rod or bar having a temperature of approximately 850°C at the end of the quenching step; and subsequently cooling the rod or bar at such a rate that the core transforms to ferrite and carbides while the surface layer of the rod or bar is tempered by the heat transferred from the core to the surface layer.

3,926,690

ALUMINIUM ALLOYS

Larry Roy Morris, Yarker, and Frederick Barry Miners, Kingston, both of Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed Aug. 9, 1973, Ser. No. 386,992

Claims priority, application United Kingdom, Aug. 23, 1972, 39355/72

Int. Cl.² C22C *21/02*

U.S. Cl. 148—32 **7 Claims**

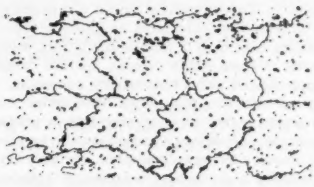
1. An as-cast aluminium magnesium silicide alloy extrusion ingot containing Al-Fe-Si, said alloy consisting essentially of 0.3–1.2% Mg, 0.2–1.2% Si, up to 0.4% Cu and up to 0.1% each Zn, Mn, 0.05–0.3% Fe as impurity and 0.15% total (0.05% each) other impurities, balance aluminum, characterized by the presence of Sr and/or Ca in a total amount of 0.01–0.5% for causing at least a major proportion of the Al-Fe-Si in the as-cast ingot to be in the α phase, thereby to reduce pickup upon extrusion of the ingot.

3,926,691

DISPERSION STRENGTHENED METALS AND ALLOYS

David A. W. Fustukian; Bud W. Kushnir, both of Edmonton; Leon F. Norris, and Robert W. Fraser, both of Fort Saskatchewan, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Division of Ser. No. 302,807, Nov. 1, 1972, Pat. No. 3,847,680. This application May 8, 1974, Ser. No. 468,040
Int. Cl.[2] B22F 3/12; C22F 1/10
U.S. Cl. 148—32 7 Claims



1. A dispersion strengthened wrought product having a matrix consisting essentially of at least one of (a) nickel, (b) cobalt and (c) alloys of nickel and cobalt with each other and with chromium, said matrix having up to about 30% by volume submicron refractory oxide particles uniformly dispersed therethrough and said matrix having a microstructure characterized by large grains which are defined by irregular grain boundaries, said grains being in the size range of 50 to 1000 millimicrons and being equi-axed in the sense that the ratio of the diameter of a sphere inscribed within any grain to the diameter of a sphere circumscribed about the same grain is not less than about 0.2 as measured from the ratio of the diameters of the inscribed and circumscribed circles on any such grain in a random planar section of said matrix.

3,926,692

DRAWABILITY OF DEOXIDIZED STEELS BY THE ADDITION OF PHOSPHORUS AND SILICON

David C. Ludwigson, Hempfield Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 30, 1974, Ser. No. 510,844
Int. Cl.[2] C22C 38/00
U.S. Cl. 148—36 2 Claims

1. A deep drawable killed-steel sheet product exhibiting an *R* value of at least about 2.0, the composition of which consists essentially of, in weight percent,

C	0.010 – 0.1
Mn	0.22 max.
P	0.03 – 0.05
Si	0.02 – 0.06
oxygen	0.02 max.

balance Fe and incidental steelmaking impurities, said product having been produced from a steel melt which was killed in order to reduce the oxygen content thereof to said maximum percentage.

3,926,693

METHOD OF MAKING A DOUBLE DIFFUSED TRAPATT DIODE

Hirohisa Kawamoto, Kendall Park; Hans John Prager, Belle Mead, and John Joseph Risko, Cranbury, all of N.J., assignors to RCA Corporation, New York, N.Y.

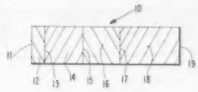
Filed Apr. 29, 1974, Ser. No. 464,765
Int. Cl.[2] H01L 21/20, 21/225, 29/90
U.S. Cl. 148—175 5 Claims

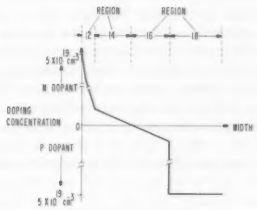
1. A method of fabricating a TRAPATT diode from a substrate having high dopant concentration of a given conductivity type comprising the steps of:

a. epitaxially growing on said substrate an epitaxial region of the same conductivity type as said substrate but of lower doping concentration than the doping concentration of said substrate, said epitaxial region having a surface opposed to said substrate;

b. depositing on said opposed surface a dopant of the opposite conductivity type as said substrate, and of lower doping concentration than the dopant concentration of said substrate,

c. diffusing said opposite conductivity type dopant into said epitaxial region such that a portion of said epitaxial region contiguous to said opposed surface forms a region of said opposite conductivity type and such that said high





dopant in said substrate diffuses into the remaining portion of said epitaxial region, to thereby form in said epitaxial region a P-N junction, and a graded doping concentration, having a predetermined gradient, extending through said junction;

d. depositing a further dopant of said opposite conductivity type on said opposed surface, said further dopant having a higher concentration than said firstmentioned dopant of said opposite conductivity type;

e. diffusing said further dopant into said opposite conductivity type region, such that a portion of said opposite conductivity type region contiguous to said opposed surface forms a heavily doped region of said opposite conductivity type, said heavily doped region having a doping concentration decreasing from said opposed surface with a gradient steeper than said predetermined gradient.

3,926,694

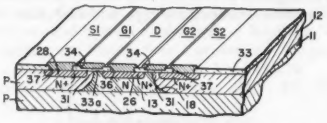
DOUBLE DIFFUSED METAL OXIDE SEMICONDUCTOR STRUCTURE WITH ISOLATED SOURCE AND DRAIN AND METHOD

Thomas P. Cauge, Mountain View, and Joseph Kocsis, Sunnyvale, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 274,442, July 24, 1972, abandoned. This application May 14, 1973, Ser. No. 359,858
Int. Cl.[2] H01L 21/22
U.S. Cl. 148—187 8 Claims

1. In a method for forming a metal insulator semiconductor structure, providing a semiconductor body having at least a portion thereof with an impurity of one conductivity type, forming a layer of semiconductor material of opposite conductivity type on said body to form a first PN junction between said body and said layer of semiconductor material, said layer having a substantially planar surface, forming a mask on said surface of the semiconductor layer having an edge overly-

ing said surface, diffusing with an impurity of said one conductivity type through said surface utilizing said mask to provide a first region of said one conductivity type having a depth which extends from said surface through said layer of semiconductor material to said semiconductor body and being defined by a PN junction which extends from the surface beneath the mask through the layer to the semiconductor body, diffusing with heat an impurity of opposite conductivity type through said surface using the same edge of the mask to form a second region in said first region which is offset in said first region and with a surface area substantially less than the surface area of said first region and which is defined by a



second PN junction which extends to the surface below the mask, said second region having a depth substantially less than the depth of said first region, said last named diffusion of said impurity of opposite conductivity type causing movement of said second PN junction so that the line along which it extends to the surface is beneath said mask, controlling the diffusion of said first and second regions whereby said first and second PN junctions define a channel underlying the mask having a precisely controlled length, providing a layer of insulating material on the surface, and providing metalization on said layer of insulating material for forming gate, source and drain contacts.

3,926,695

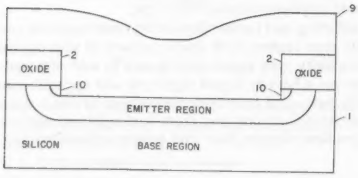
ETCHED SILICON WASHED EMITTER PROCESS

Aung San U, Rangoon, Burma, assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Dec. 27, 1974, Ser. No. 537,045

Int. Cl.[2] H01L *21/223*

U.S. Cl. 148—187 **8 Claims**



1. A method for providing a shallow diffused emitter region in the base region of an integrated circuit element, said base region having deposited thereon a masking layer having windows therein for exposing a portion of the surface of said base region such that an emitter region can be diffused into said base region comprising the steps of:

etching away some of the exposed base region in the intended emitter areas resulting in an underetching of said base region beneath the masking layer;

diffusing an emitter region into said base region; and

depositing a metal contact layer on the surface of said masking layer and that portion of the diffused exposed emitter region not beneath the masking layer such that a closed loop cavity around the periphery of said emitter is produced, said closed loop cavity bounded by said metal contact layer, said masking layer, and said emitter region.

3,926,696

EXPLOSIVE COMPOSITION AND EUTECTIC MIXTURE THEREFOR

Maximilian Klunsch, Opladen; Paul Lingens, Leverkusen, and Heinz Ratz, Bonn-Ippendorf, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Germany

Continuation of Ser. No. 259,353, May 26, 1972, abandoned. This application Nov. 7, 1973, Ser. No. 413,720

Claims priority, application Germany, May 29, 1971, 2126921; May 29, 1971, 2126922

Int. Cl.[2] C06B *45/00*

U.S. Cl. 149—2 **19 Claims**

1. A flowable liquid explosive liquid composition free of water insoluble brisant explosives and free of uncombined water consisting essentially of ammonium nitrate, metallic fuel and a eutectic mixture which eutectic mixture comprises an oxygen supplying salt and a combustible compound selected from the group consisting of a nitrate of an amine, a perchlorate of an amine, a derivative of ammonia, a primary alkyl amine, a primary aryl amine, a secondary alkyl amine, a secondary aryl amine, a tertiary alkyl amine, a tertiary aryl amine, an alkanolamine, a quaternary ammonium compound, an amide of formic, acetic or sulfamic acid, an ammonium salt of an aliphatic carboxylic acid, an ammonium salt of a sulfonic acid, ammonium thiocyanate, ammonium hypophosphite, ammonium thiosulfate, anhydrous sodium acetate, a monosaccharide, an oligosaccharide, coal dust, vegetable flour, wood meal, a wax, a fat, a solid hydrocarbon, a vegetable oil and a mineral oil, said eutectic composition capable of reducing the solidification point of the entire explosive composition to a temperature below +10°C.

3,926,697

SOLID BLOCK OF PROPELLANT WITH A PLURALITY OF PROPULSION STAGES AND METHODS OF MANUFACTURE

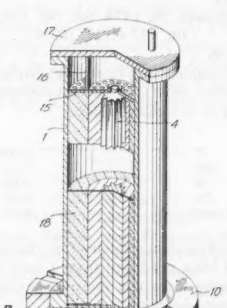
Jean Jacques Humbert; Jean Pierre Francis Thomas; Gerard Yvan Brut, and Jean Marie Joseph Elie Gounou, all of Paris, France, assignors to Societe Nationale des Poudres et Explosifs, France

Filed Oct. 15, 1969, Ser. No. 866,621

Claims priority, application France, Oct. 15, 1968, 68.169952

Int. Cl.[2] C06B *45/12*

U.S. Cl. 149—14 **15 Claims**



1. A method of producing a solid propellant block comprising a plurality of successive concentric adjacent layers of different compositions adapted to burn in sequence to provide successive stages of lift, each layer being bonded to adjacent layers by gelatinized nitrocellulose, which comprises forming a plurality of contacting adjacent layers of different compositions in a mold, each layer consisting of a propellant composition comprising nitrocellulose as the principal ingredient, at

least one of said adjacent layers consisting of granules of a base powder of a propellant composition the principal ingredient thereof being nitrocellulose, introducing a molding agent comprising nitroglycerine or a polyalcohol nitrate as the principal ingredient, under vacuum into at least said layer consisting of said base powder to cause at first flow of said nitroglycerine or said polyalcohol nitrate into the interstices between the granules of said base powder and heating in the mold at a temperature and for a period of time sufficient to cause molding of said base powder in situ and gelatinization of the nitrocellulose of said base powder and at the contact surface of the adjacent layers thereof, whereby said layer formed from said base powder is sealed to its adjacent layers by means of said gelatinized nitrocellulose.

3,926,698
EXPLOSIVE COMPOSITIONS CONTAINING METALLIC FUEL PARTICLES AND METHOD OF PREPARATION THEREOF

Melvin A. Cook, Salt Lake City, and Mark J. Hagmann, Summit Park, both of Utah, assignors to Ireco Chemicals, Salt Lake City, Utah

Filed Feb. 21, 1974, Ser. No. 444,691
Int. Cl.² C06B *33/02*
U.S. Cl. 149—44 **12 Claims**

1. A method for preventing the loss of sensitivity of a gas-containing blasting composition upon being worked which composition comprises a continuous thickened solution phase having dissolved therein at least one inorganic oxidizer salt and metallic particles as fuel and/or sensitizer dispersed throughout the solution phase which method includes incorporating into the solution phase a small amount of a miscible, liquid collector, which is capable of causing floatation of the metallic particles in the solution phase when such phase is not thickened and which retains its liquidity and miscibility at intended temperatures of working.

8. In an explosive composition comprising a thickened solution phase of at least one oxidizing salt and metallic particles as fuel and/or sensitizer dispersed throughout the solution phase the improvement comprising, in the solution phase, a small amount of a miscible, liquid collector, which is capable of causing flotation of the metallic particles in the solution phase when such solution phase is not thickened and which retains its liquidity and miscibility at intended temperatures of working, to prevent the metallic particles from becoming wetted upon working thereby causing the composition to lose its sensitivity.

3,926,699
METHOD OF PREPARING PRINTED CIRCUIT BOARDS WITH TERMINAL TABS

Charles H. Dixon, Waukesha, Wis., assignor to RBP Chemical Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 479,705, June 17, 1974, abandoned, which is a division of Ser. No. 322,040, Jan. 8, 1973, Pat. No. 3,841,905. This application Dec. 18, 1974, Ser. No. 534,034
Int. Cl.² C23F *1/02*
U.S. Cl. 156—3 **7 Claims**

1. The method of rapidly stripping a layer of metal selected from the group consisting of lead-tin solder and tin from a layer of copper on a fiberglass circuit board without adversely affecting the copper and fiberglass, said process comprising the steps of: exposing the solder to a composition comprising ammonium bifluoride in the range of 10% to 25% by weight, hydrogen peroxide in the range of 1% to 5% by weight, and water in the range of 89% to 70% by weight for a time sufficient to remove the solder, and rinsing the said composition from the copper after the solder has been effectively stripped and before the copper and plastic have been adversely affected.

3,926,700
CELLULAR-URETHANE BACKED CARPET

Henry S. Hopkins, Jr., Ashland, Ohio, and Philip L. Gordon, Lexington, Mass., assignors to General Latex and Chemical Corporation, Cambridge, Mass.

Division of Ser. No. 163,017, July 15, 1971, abandoned, which is a continuation of Ser. No. 878,330, Nov. 20, 1969, abandoned. This application Apr. 13, 1973, Ser. No. 350,694
Int. Cl.² B32B *5/18;* **D04H** *11/00*
U.S. Cl. 428—95 **17 Claims**

ADD WATER SCAVENGER TO ELASTOMERIC URETHANE RESIN
MECHANICALLY MIX AIR INTO ELASTOMERIC URETHANE RESIN TO PROVIDE FOAM
APPLY FOAM LAYER ONTO BACK OF CARPET
APPLY RELEASE BELT TO EXPOSED FOAM SURFACE
CURE FOAM BETWEEN CARPET BACK AND RELEASE BELT
REMOVE RELEASE BELT

1. A sheet material which comprises in combination:

a fibrous backing sheet and a layer of a cured, flexible, elastomeric, cellular urethane resin securely and directly bonded to the fibers on one surface of the backing sheet, the urethane resin containing in combination:

a. a silicone fluid surfactant in an amount to aid in uniform cell structure;

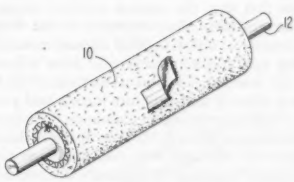
b. a catalyst to control the rate of cure; and

c. from about **0.1** to **5.0** percent by weight of a moisture-scavenging agent, the cellular layer characterized by being composed of essentially uniform, open and interconnecting cells, the exposed foam surface characterized by a smooth thin skin resin layer substantially free of craters, pimples and ridges therein.

3,926,701
METHOD AND COVERING FABRIC FOR A DAMPING FORM ROLLER OF AN OFFSET PRINTING MACHINE

Hiroshi Nishiwaki, Osaka, Japan, assignor to Unitika Ltd., Amagasaki and Katsura Roller Mfg. Co., Ltd., Osaka, both of, Japan

Continuation-in-part of Ser. No. 143,607, May 14, 1971, abandoned. This application Sept. 26, 1973, Ser. No. 400,991
Int. Cl.² B21B *31/08;* **B60B** *7/00*
U.S. Cl. 156—86 **2 Claims**



1. In cylindrical damping form covers which are water-shrinkable over damping form rollers, the improvement wherein a damping form cover comprises

pile yarns composed of hydrophilic vegetable or regenerated fibers and

ground yarns composed of lightly heat-treated and nonacetalized multifilament polyvinyl alcohol fibers, said multifilament polyvinyl alcohol fibers being capable of shrinking by **27-40%** in the direction of the length thereof when moistened with water in the absence of previous stretching.

whereby said damping form cover may be fixed firmly on a damping form roller 5% or less smaller in diameter than said damping form cover due to the shrinkage of the ground yarns when the roller is inserted therein, both ends of the damping form cover are fixed with fibers, and the roller and cover are moistened.

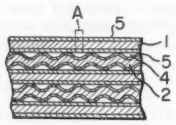
2. A method of covering a damping form roller for an offset printing machine comprising the steps of:

1. forming a cylindrical cover from a fabric comprising:
   a. pile yarns composed of hydrophilic vegetable or regenerated fibers and
   b. ground yarns composed of lightly heat-treated and nonacetalized multifilament polyvinyl alcohol fibers, said multifilament polyvinyl alcohol fibers being capable of shrinking by 27–40% in the direction of the length thereof when moistened with water in the absence of previous stretching;
2. inserting the roller into the cylindrical cover; and
3. wetting the roller and cylindrical fabric with water until the cylindrical fabric has shrunk sufficiently to firmly position the cylindrical fabric on the roller.

3,926,702
CERAMIC STRUCTURES AND PROCESS FOR PRODUCING THE SAME

Masami Oki, Nagoya; Ryuzo Hori, Toyota, and Naoto Miwa, Kariya, all of Japan, assignors to Asamura Patent Office, Japan

Filed Mar. 27, 1973, Ser. No. 345,456
Claims priority, application Japan, Mar. 29, 1972, 47-32039; Mar. 29, 1972, 47-32041
Int. Cl.[2] C04B *37/00, 39/12, 41/06;* **B32B** *3/12*
U.S. Cl. 156—89 **6 Claims**



1. A process for producing a ceramic structure which comprises forming in a first step optional-shaped substrates with a mixture of a ceramic material, an organic material and a solvent capable of dissolving said organic material and then firing said substrate; in a second step laminating said substrates to form a structure having fluid passages between said substrates; in a third step dipping said structure in a slurry consisting of the same ceramic material as the ceramic material in the first step, the organic material being present in a greater amount than that employed in the first step and a solvent capable of dissolving said organic material; in a fourth step firing said dipped structure to form a porous ceramic layer on the internal and external surfaces of said structure; in a fifth step dipping said structure having said porous ceramic layer in a liquid containing an aluminum compound which can be transformed to γ- or δ-Al_2O_3 by thermal decompostion to fill the pores in said layer with said aluminum compound and then firing said structure to thermally decompose said aluminum compound to γ- or δ-Al_20_3. O

5. A process for producing a ceramic structure which comprises forming in a first step optional-shaped substrates with a mixture of a ceramic material, an organic material and a solvent capable of dissolving said organic material and then firing said substrate; in a second step dipping said structure in a slurry consisting of the same ceramic material same as the ceramic material in the first step, the organic material being present in a greater amount than that employed in the first step and a solvent capable of dissolving said organic material; in a third step laminating said substrates to form a structure having fluid passages between said substrates; in a fourth step firing said dipped structure to form a porous ceramic layer on the internal and external surfaces of said structure; and in a fifth step dipping said structure having said porous ceramic layer in a liquid containing an aluminum compound which can be transformed to γ- or δ-Al_2O_3 by thermal decomposition to fill the pores in said layer with said aluminum compound and then firing said structure to thermally decompose said aluminum compound to γ- or δ-Al_2O_3.

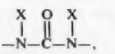
3,926,703
METAL-RUBBER ADHESION SYSTEM

Stephen E. Cantor, Cheshire, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 319,273, Dec. 29, 1972, Pat. No. 3,862,883. This application June 11, 1974, Ser. No. 478,411
Int. Cl.[2] B29H *17/00;* **C09J** *3/12;* **C08L** *7/00*
U.S. Cl. 156—124 **11 Claims**

1. In the method of adhering a metallic reinforcing element having a surface of brass to rubber by applying a vulcanizable rubber composition to the element and heating the assembly to vulcanize the rubber, the steps comprising:

Incorporating in the rubber composition before vulcanization a halogen donor selected from the group consisting of 1) N,N-dihalogenated aromatic sulfonamides wherein the sulfonamide nitrogen is bonded to two atoms of chlorine, bromine or iodine and the sulfonyl sulfur is bonded directly to the aromatic nucleus and 2) cyclic N-halogenated amides wherein a carbonyl carbon in the ring is bonded to two nitrogen atoms, each of said nitrogen atoms in turn being bonded to a halogen atom thereby forming the grouping



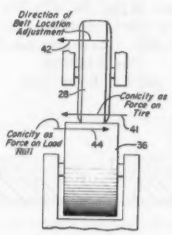
wherein X is chlorine, bromine or iodine and,

B. Incorporating in the rubber composition a member selected from the group consisting of resorcinol, m-aminophenol, m-phenylene diamine, resorcinol monoacetate, resorcinol diacetate, 1,5-naphthalenediol, partially reacted resorcinol-formaldehyde resins, condensation products of resorcinol and acetone, and condensation products of resorcinol and acetaldehyde.

3,926,704
FORCE VARIATION MEASUREMENTS ON UNVULCANIZED TIRES

William J. Sharp, Jr., Union City, Tenn., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 2, 1974, Ser. No. 528,748
Int. Cl.[2] B29H *17/02;* **G01M** *17/02*
U.S. Cl. 156—126 **14 Claims**



1. In a process of manufacturing a belted pneumatic tire on a tire building machine of the type having means to position an uncured belt structure on an uncured carcass structure in a predetermined location on said carcass structure relative to axial directions, the improvement comprising: after said belt

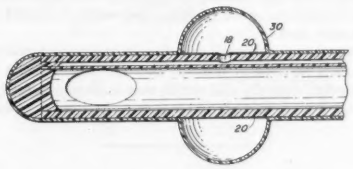
structure is placed on said carcass structure but before said tire is vulcanized determining the conicity of said tire, comparing said conicity with a predetermined maximum allowable conicity for the unvulcanized tire and adjusting the predetermined location on said carcass structure relative to axial directions to reduce the conicity in subsequent tires built on said machine to within the maximum allowable conicity.

3,926,705

SILICONE CATHETER AND PROCESS FOR MANUFACTURING SAME

Donald A. Todd, Elk Grove Village, Ill., assignor to Western Acadia, Incorporated, Chicago, Ill.

Filed July 25, 1974, Ser. No. 491,623
Int. Cl.² B65H *81/00*
U.S. Cl. 156—155 9 Claims



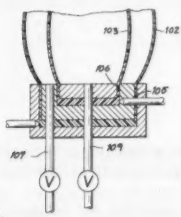
1. A method for forming a catheter comprising the steps of:
1. forming a tubular body comprising a primary lumen and an inflation lumen;
2. forming a first hole in said tube to permit communication between said inflation lumen and the exterior of said tube;
3. applying a thin layer of thermoplastic material around the exterior of said tube to overlap said first hole;
4. applying an outer layer of covering material, which does not adhere to the thermoplastic material, to the exterior of said tube to form a covered tube;
5. forming a second hole in the covered tube to permit communication between said primary lumen and the exterior of said covered tube; and
6. forming a third hole in said thermoplastic material adjacent said first hole.

3,926,706

FILM BLOWING METHOD

Fritz Reifenhäuser, Troisdorf, and Herbert Rahlfs, Troisdorf-Sieglar, both of Germany, assignors to Reifenhauser KG, Troisdorf, Germany

Continuation-in-part of Ser. No. 86,214, Nov. 2, 1970, Pat. No. 3,726,743. This application Dec. 11, 1972, Ser. No. 314,040
Claims priority, application Germany, Oct. 31, 1969, 1954824
Int. Cl.² B32B *1/08;* B29D *23/04*
U.S. Cl. 156—229 3 Claims



1. A method of producing a multilayer foil, comprising the steps of:

coaxially extruding an inner thermoplastic tube within an outer thermoplastic tube from outlets lying in a common plane; blowing each tube independently of and out of contact with the other from different blowing sources to stretch the outer tube independently of the inner tube and impart different degrees of orientation in the direction of extrusion and transversely thereto; and collectively pinching said tubes downstream of said blowing step with their surfaces bonding together.

3,926,707

USE OF TEMPORARY PRINTING CARRIERS

Heinz Glaser, Kandern, and Vassil Zlatareff, Fullinsdorf, both of Switzerland, assignors to Societe d'Etudes du Procede NORIDEM, Glarus, Switzerland

Division of Ser. No. 297,032, Oct. 4, 1972, Pat. No. 3,870,539. This application Nov. 11, 1974, Ser. No. 522,864
Claims priority, application Switzerland, Oct. 6, 1971, 11481/71; July 28, 1972, 11293/72
Int. Cl.² B32B *31/20, 27/08;* B44C *1/16*
U.S. Cl. 156—239 4 Claims

1. A process for the transfer of a vinyl resin film onto a definitive A.B.S., polycarbonate, polyvinyl chloride or polystyrene surface which comprises

bringing the said A.B.S., polycarbonate, polyvinyl chloride or polystyrene surface into contact with the adhesive surface of a temporary carrier comprising, as the base, paper, aluminum, regenerated cellulose, polyester terephthalate, or polyolefine sheets or laminates thereof said base carrying on one of its surfaces a detachable film of pigmented vinyl resins, having an underlying layer between the base and said detachable film consisting of a mixture of nitrocellulose and an aminoplast or of nitrocellulose and an alkyd resin, the said detachable film having an overlying thin adhesive layer containing resins which are soluble in organic solvents and which possess a pendulum hardness according to Konig (DIN 53157) of at least 85 seconds,

exposing the surfaces while in contact to the action of heat, pressure or both to cause the adhesive layer and detachable film to transfer onto the said A.B.S., polycarbonate, polyvinyl chloride or polystyrene surface, and

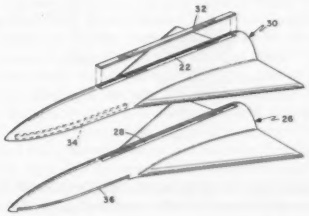
removing the said temporary carrier base with the said underlying layer.

3,926,708

METHOD OF MANUFACTURING HIGH STRENGTH FIBER REINFORCED THERMO PLASTIC PARTS

Roger A. Long, Escondido, Calif., assignor to Teledyne Ryan Aeronautical a Division of Teledyne Industries, Inc., San Diego, Calif.

Filed Oct. 25, 1972, Ser. No. 300,846
Int. Cl. B29b *23/00*
U.S. Cl. 156—242 6 Claims



1. A method of forming high-strength fiber-reinforced thermo plastic parts comprising the steps of,

heating thermo plastic material to a temperature at which it is readily formable,
forming said material to the desired final configuration by drawing said material by a vacuum onto a mold,
permitting said plastic material to cool and harden,
applying an elongated fiber reinforcing to selective locations on at least one of said surfaces of said material by placing tapes of elongated high strength, and high modulus fibers in a matrix of thermo plastic material onto the surface of the formed thermo plastic part,
bonding said tapes at said selective locations by heating said thermo plastic matrix material in said tapes.

3,926,709
GLASSY MATERIALS FROM PLUMBITES AND CELLULOSICS

Truman L. Ward; Ruth R. Benerito, both of New Orleans, and Jacques J. Hebert, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

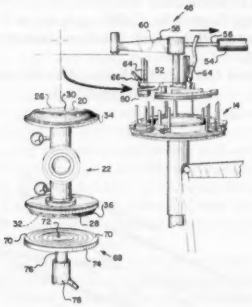
Filed Aug. 22, 1974, Ser. No. 499,689
Int. Cl.² C09J *5/02, 7/00*
U.S. Cl. 156—309 **1 Claim**

1. A process for bonding high silicon content surfaces with each other, the process comprising . . .
a. placing a polysaccharide premodified by reaction with sodium plumbite to a lead content of about from 8% to 37%, between high silicon content surfaces to be joined,
b. placing or otherwise securing the component parts to provide an immobile assembly,
c. heating the immobile assembly in a closed oven or other low oxygen atmosphere, from a temperature below 200°C to temperatures of about from 600° to 700°C., and maintaining that temperature for about at least 60 minutes, and
d. cooling the immobile heated assembly gradually to avoid fracturing the original silicon surfaces.

3,926,710
APPARATUS FOR APPLYING DECALCOMANIA

Saul Weingrad, Hillsdale, N.J.; Albert J. Wahl, Fredonia; Richard C. Mucha, Brocton, both of N.Y., and Robert E. Gould, Washington, D.C., assignors to Commercial Decal, Inc., Mount Vernon, N.Y.

Filed Oct. 16, 1972, Ser. No. 297,631
Int. Cl.² B65C *9/06, 9/14, 9/36, 9/40*
U.S. Cl. 156—362 **8 Claims**

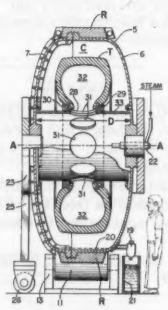


1. Apparatus for applying at least two decals to a piece of ware in a single decal transfer step; said apparatus comprising;
first means for holding a supply of decals, said first means comprising at least two storage bins;
second means for temporarily holding at least two preselectively shaped decals in a predetermined position with respect to the piece of ware to be decorated, said second means including a resilient porous decal seating surface for said decals, and vacuum means for applying a reduced pressure behind said porous decal seating surface;
third means for transferring said decals from said first means to said second means, said third means comprising at least two pick-up heads aligned above said stacks of decals, suction means applied to said pick-up heads for transferring the top-most decal from each of said stacks to a respective pick-up surface, position change means for moving said pick-up heads between an initial position above said stacks and a final position above said second means, and pick-up head movement means for moving said pick-up heads into contact with said second means, said pick-up head movement means including drive means for pivotally moving said pick-up heads between positions in a common plane and positions in engagement with said porous seating surface;
fourth means for holding the piece of ware to be decorated in a predetermined position with respect to said second means; and
fifth means for moving said fourth means and said second means into decal transfer position with respect to one another whereby said decals may be simultaneously transferred from said second means to said piece of ware.

3,926,711
PORTABLE ROTATING KETTLE USED IN RETREADING TIRES

Merritt W. Wolfe, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 5, 1972, Ser. No. 286,382
Int. Cl.² B29H *5/04*
U.S. Cl. 156—394 **14 Claims**

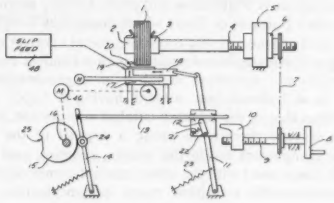


1. A kettle used in repairing or retreading tires, comprising:
a. at least two opposing sections forming a chamber for receiving a tire;
b. means for mounting the sections for unitary rotation about an axis angularly disposed to a vertical plane; and
c. means for mounting a tire in the chamber for unitary rotation with the sections and rotation about the rotational axis of the sections.

3,926,712
APPARATUS FOR BINDING PILES OF SHEETS OR LEAVES

Josef Wetzler; Wilhelm Neumann, both of Rosenheim, and Karlheinz Hesselman, Au b. Bad Aibling, all of Germany, assignors to Fa. Planatolwerk Willy Hesselmann, Rosenheim, Germany

Continuation-in-part of Ser. No. 284,862, Aug. 30, 1972, abandoned. This application Jan. 30, 1974, Ser. No. 437,886
Claims priority, application Germany, Sept. 2, 1971, 2144101
Int. Cl.² B42C *13/00*
U.S. Cl. 156—477 B **5 Claims**



1. In an apparatus for the adhesive binding of a stack of sheets with a foil coated with a thermally activatable adhesive by depositing the foil upon a hot plate having a stationary member horizontally fixed but vertically movable and a movable member horizontally displaceable relative to the stationary member to receive an edge of the stack between said members and, upon vertical displacement of said hot plate, to fold the foil around said edge, the improvement which comprises:

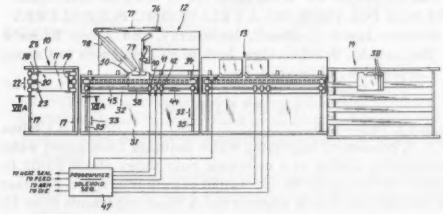
clamping means engageable with said stack and including two parts separable by the width of said stack; and

means for coupling at least one of said parts with said movable member for positioning said movable member in spaced relation relative to said stationary member in dependence upon the spacing of said parts.

3,926,713
APPARATUS FOR PRODUCING AND ASSEMBLING TABBED CARDS

William F. Lowe, Bridgehampton, and Harry L. Bondy, Plainview, both of N.Y., assignors to E-Z Machine Corporation, Plainview, N.Y.

Filed Aug. 30, 1973, Ser. No. 392,994
Int. Cl.² B32B *31/20;* **B65C** *9/06;* **B30B** *15/34*
U.S. Cl. 156—510 **5 Claims**



1. An apparatus for producing tabbed sheet elements comprising:

means for forming a succession of tabs, said tabs being generally channel-shaped with shanks adapted to straddle an edge of a respective sheet element

means for feeding said tabs to a tab-applying station;

means at said station for affixing each of said tabs to a respective sheet element disposed at said station;

means for controlling the position of the bight of each tab relative to said edge of the respective sheet element,

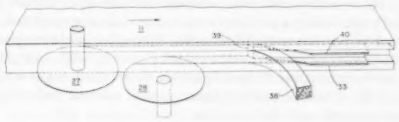
means for feeding a succession of sheet elements to said station, to enable said sheet elements to receive respective tabs; and

selectively operable stop means engageable with said sheet elements for locating the successive sheet elements at different positions with respect to said station whereby the tabs are applied to the successive sheet elements at locations along said edge thereof varying in accordance with the stopped positions of said sheet elements, said means for feeding said tabs to said station including an arm swingable substantially in the plane of said sheet elements and having a free end successively receiving said tabs, each tab carried by said arm describing an orbit, said edge of each sheet element extending along a secant of said orbit, and s slide carrying said arm and shiftable perpendicularly to said edge at said station, said means for controlling the relative position of the bight of each tab with respect to said edge of each sheet element including means for limiting the advance of said slide, said arm being provided with a slot open in the direction of said sheet elements and receiving the bight of said tabs.

3,926,714
METHOD AND APPARATUS FOR PRODUCING FOAMED THERMOPLASTIC INSULATION BOARDS

Dikrun Der Marderosian, Sudbury, and Paul Albert Tremblay, Billerica, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed June 24, 1974, Ser. No. 482,141
Int. Cl.² B32B *31/00*
U.S. Cl. 156—516 **3 Claims**

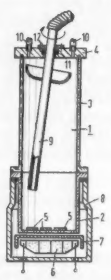


1. An apparatus for the production of a continuous length of grooved, laminated, foamed thermoplastic resin insulation board from discontinuous lengths thereof, said apparatus comprising a frame; means supported by said frame for moving said board relative to said frame; means for laminating a continuous sheet of flexible material to the upper surface of said board; means for laminating a continuous sheet of flexible material to the lower surface of said board; a pair of spaced, rotatable, smooth-edged circular knives positioned to form two spaced continuous slits in a surface of said board; a tool positioned to work between said slits and to remove resinous board material from therebetween and thereby form a groove in said board, said tool having a flat, elongated rectangular bottom having a chisel-shaped leading knife edge tapered on one side to direct board material away from said board and a width corresponding to the distance between said knives, said tool further having upstanding side walls rearward of said leading edge and perpendicular to said bottom; and means to heat said tool to at least the softening temperature of the resinous board.

3,926,715
METHOD OF EPITACTIC PRECIPITATION OF INORGANIC MATERIAL

Erhard Süssmann, Poing, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation of Ser. No. 219,880, Jan. 21, 1972, abandoned, which is a continuation of Ser. No. 848,971, Aug. 11, 1969, abandoned. This application Jan. 21, 1974, Ser. No. 435,084
Claims priority, application Germany, Aug. 14, 1968, 1769968
Int. Cl.² B01D 9/00, 7/02
U.S. Cl. 156—612 4 Claims



1. A method of epitactic precipitation of a silicon layer on the surface of a wafer of silicon monocrystal from which surface impurities and dislocations have been removed, which consists sequentially in oxidizing the surface of said silicon monocrystal having surface impurities and dislocations, for a time to produce from the silicon in said surface a SiO_2 layer sufficient to encompass said surface impurities and dislocations of from about 10 A thick on the surface of the silicon monocrystal wafer, removing completely the resultant SiO_2 layer by annealing said silicon wafer in hydrogen or inert gas thereby producing a surface on the silicon monocrystal free of surface impurities and dislocations, thereafter subjecting said newly produced silicon surface out of contact with an oxidizing medium to epitactic precipitation by a reaction gas which effects the epitactic precipitation on said surface free of surface impurities and dislocations.

3,926,716
TRANSFER AND ADHERENCE OF RELATIVELY DRY PAPER WEB TO A ROTATING CYLINDRICAL SURFACE

Gregory A. Bates, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 19, 1974, Ser. No. 452,610
Int. Cl.² B31F 1/12
U.S. Cl. 162—113 32 Claims

1. A process for manufacturing a soft and absorbent tissue paper web having a uniform basis weight of about 5 to about 40 pounds per 3000 square feet, said process comprising the steps of

a. drying without compacting a moist paper web to provide a fiber consistency exceeding about 68% and ranging up to about 98% while said web is on a patterned imprinting fabric;

b. imprinting the resulting relatively dry web with the pattern of the imprinting fabric;

c. applying an aqueous polyvinyl alcohol solution to cause transfer and adherence of the imprinted web to a rotating cylindrical surface, said polyvinyl alcohol being characterized by a degree of hyrolysis ranging from about 80% to about 90% and a viscosity as a 4% aqueous solution at 20°C. exceeding about 20 centipoises.

3,926,717
PROCESS FOR FORMING A POLYMERIC FILM INSIDE A CELLULOSIC MATRIX AND PRODUCT OBTAINED THEREFROM

Robert H. Marchessault, Mount Royal, and Bohuslav Fisa, Montreal, both of Canada, assignors to Her Majesty, The Queen, in Right of Canada, as represented by the Minister of Nat. Defence

Filed Oct. 29, 1973, Ser. No. 410,560
Claims priority, application Canada, Jan. 22, 1973, 162457
Int. Cl.² D21F 11/00
U.S. Cl. 162—157 C 13 Claims

1. A process for preparing a shaped fibrous cellulosic material having deposited therein a complementary matrix of a polymer which is continuous and preferentially surrounds the non-bonded portions of fibers which comprises forming a two component organometallic-transition metal catalyst system by treating a fibrous cellulosic matrix with a catalyst component selected from a transition metal or an organometallic compound in a hydrocarbon solvent having a vapor pressure higher than that of the selected catalyst component, evaporating the solvent thereby to cause a deposit of the selected catalyst component inside the matrix, reacting said selected catalyst component with the other catalyst component to form an organometallic-transition metal polymerization catalyst inside the matrix and treating said matrix containing the polymerization catalyst with a monomer which is an aliphatic 1-olefin monomer having less than 6 carbon atoms, methyl methacrylate or styrene to form a continuous complementary polymeric matrix inside the shaped fibrous cellulosic matrix, the product formed being characterized by having a continuous and papillary coating of said polymeric matrix throughout the interstitial spaces of the fiberous cellulose matrix.

8. A shaped, fibrous, cellulosic matrix having a continuous complementary polymer matrix distributed inside said cellulosic matrix in the interstitial spaces thereof conforming substantially to the internal and external shape of said cellulosic matrix and surrounding the non-bonded portions of the fibers constituting the cellulosic matrix whereby the original interfiber bonding of the cellulosic matrix is retained, said complementary polymer matrix not being visibly distinguishable but chemically separable from the cellulosic matrix and said polymer being a polymerized aliphatic 1-olefin monomer having less than six carbon atoms.

3,926,718
PROCESS OF IMPROVING WATER DRAINAGE FROM PAPER WEBS BY ADDITION OF A WATER SOLUBLE BLOCK POLYMER TO A CELLULOSIC PULP SLURRY

Lawrence James Guilbault, McMurray, and James Richard Zakrzewski, Brackenridge, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

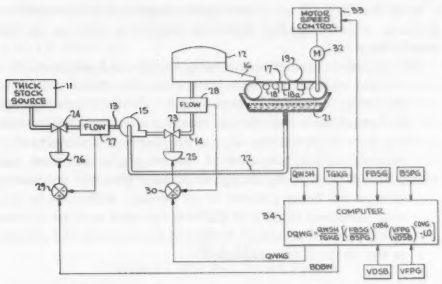
Filed Apr. 30, 1974, Ser. No. 465,717
Int. Cl.² D21D 3/00
U.S. Cl. 162—168 8 Claims

1. A process of improving water drainage from paper webs comprising adding to a cellulosic pulp slurry about 0.001 to about 1%, based on the dry weight of pulp fibers, of a polymer of the formula A-B-A wherein the A block represents from 10 to 100,000 mer units of a water-soluble monomer selected from the group consisting of 3-acrylamido-3-methyl butyl trimethyl ammonium chloride, 2-acrylamido-2-methyl propane sulfonic acid, dimethyl diallyl ammonium chloride, methacryloyloxyethyl trimethyl ammonium chloride, methacryloyloxyethyl trimethyl ammonium methosulfate and acrylamide and the B block represents from 10 to 5,000 mer units of N-vinylpyrrolidone, depositing the pulp onto a forming surface and draining the water from the fiber network.

3,926,719
DRY LINE CONTROLLER

David A. Spitz, Columbus, Ohio, assignor to Industrial Nucleonics Corporation, Columbus, Ohio

Filed Jan. 25, 1972, Ser. No. 220,635
Int. Cl.[2] D21F 1/06, 1/08
U.S. Cl. 162—253 2 Claims



1. A system for maintaining the position of a dry line on a Fourdrinier wire at substantially the same location after a change in a fibrous product grade formed on the wire as before the change, said wire being responsive to the same type of thick stock throughout the change, said fibrous product being formed in response to a fiber water slurry fed to the wire and that is relatively dilute compared to the thick stock, comprising a first control for changing the fibrous product grade, said first control comprising means for deriving signals indicative of values for bone dry basis weight of the product before and after said change by said first control and indicative of values for wire speed before and after said change, said changes in bone dry basis weight and wire speed resulting in said change in the fibrous product grade, means responsive to said bone dry basis weight signals for incrementally controlling bone dry basis weight of the product, and means responsive to said wire speed signals for incrementally controlling the speed of the wire, a second control comprising means for incrementally controlling the flow rate of the fiber water slurry being fed to the wire in response to the signals indicative of the wire speed and bone dry basis weight before and after the change, all of said incremental control means being activated concomitantly and with such magnitude that the dry line position before the change is substantially the same as after the change, said second control for incrementally controlling the fiber flow rate includes means for computing:

$$DQWG = \frac{QWSH}{TGKG} \cdot \frac{FBSG}{BSPG}^{COBG} \cdot \frac{VFPG}{VDSB}^{COVG} - 1.0$$

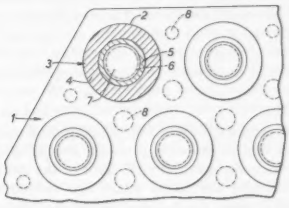
where:

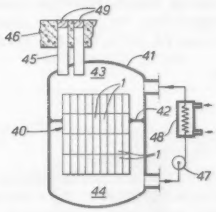
DQWG = stream flow change during each step,
QWSH = stream flow set point prior to the change,
TGKG = the number of increments required to make the change,
FBSG = bone dry basis weight set point prior to the change,
BSPG = bone dry basis weight set point subsequent to the change,
VFPG = wire speed set point after the change,
VDSB = wire speed set point prior to the change,
COVG = a constant determined from a curve fit of the vacuum profile between the table rolls and wire, as a function of wire velocity; and
COBG = a constant determined from a curve fit of the vacuum profile between the table rolls and the wire, as a function of bone dry basis weight.

3,926,720
GAS COOLED NUCLEAR REACTOR FUEL ELEMENTS

Samuel Brittan Hosegood, Wareham, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed May 24, 1973, Ser. No. 363,567
Claims priority, application United Kingdom, June 9, 1972, 27053/72
Int. Cl.[2] G21C 3/08; G21G 1/02
U.S. Cl. 176—18 7 Claims





1. A nuclear fuel unit for the reactor core of a gas-cooled nuclear reactor of the thermal type comprising a block of moderating material having an array of parallel holes formed therein, disposed in each hole a fissile material region formed from fissile plutonium, a fertile material region enclosing and surrounding each fissile material region in such manner that in a nuclear reactor the neutron flux thermalized by the block of moderating material must before reaching a fissile material region, encounter fertile material, and coolant channels for permitting gas coolant to remove heat from the fissile material regions.

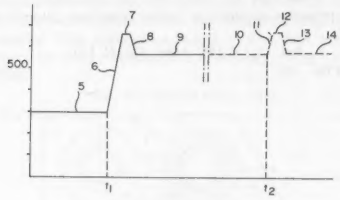
3,926,721
METHOD OF OPERATING A WATER-COOLED NUCLEAR REACTOR

Gunnar Lysell, Nykoping, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed June 15, 1973, Ser. No. 370,206
Claims priority, application Sweden, June 29, 1972, 8579/72
Int. Cl. G21b 3/06, 7/00, 17/00
U.S. Cl. 176—19 R 3 Claims

1. In a water-cooled nuclear reactor comprising fuel rods of the type containing oxidic nuclear fuel enclosed by a covering of a zirconium alloy, the method of operating the reactor so that the stress corrosion caused in the covering at least in part by the production of fission products is avoided, comprising the steps of operating the nuclear reactor at a desired power output, rapidly increasing the power output of the reactor at a rate not less than 0.2 W per cm of fuel rod length and per second to a power output in the range of 20 – 200 W per cm of fuel rod length above the desired power output, maintaining the increased power output for a period of time so that the

temperature at the center of the fuel rods is in the range of 10° to 100° C. below the equilibrium temperature at the increased power output, and returning the reactor to the desired power output so that during the period of the increased power output



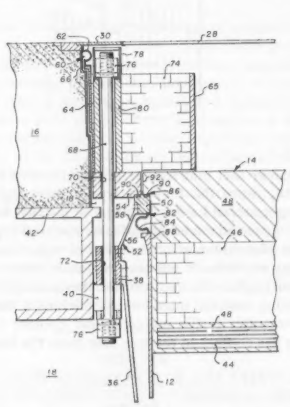
the thermal expansion caused by the increased temperature in the nuclear fuel produces a pressure on the interior of the covering which exceeds the yield limit of the zirconium alloy covering whereby the stress peaks are evened out and all temperature stresses are reduced below the critical level.

3,926,722

REACTOR VESSEL HEAD SUPPORT ARRANGEMENT

Clive Frederick George Dupen, Weatogue, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed June 29, 1973, Ser. No. 374,856
Int. Cl. G21c *13/04*
U.S. Cl. 176—87 8 Claims



1. A nuclear reactor head support arrangement comprising: a containment structure providing a vessel cavity;

a reactor vessel vertically disposed and supported within said vessel cavity;

a first support ring supported from said containment structure in said cavity, said first support ring being concentrically disposed with respect to and spaced from said vessel;

a plurality of flexible struts spaced about said reactor vessel, said flexible struts each having one end connected to said first support ring;

a second support ring concentrically disposed with respect to said reactor vessel, said second support ring being connected to the other ends of said flexible struts;

a vessel head for said reactor vessel, said vessel head being aligned with said vessel and supported by said second support ring at the upper end of said vessel; and

a first sealing means for preventing fluid communication between the interior of said reactor vessel and said cavity.

3,926,723

METHOD OF CONTROLLABLY RELEASING GLUCOSE TO A CELL CULTURE MEDIUM

Howard Green, Brookline, and James G. Rheinwald, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 8, 1974, Ser. No. 495,609
Int. Cl.[2] C12K *9/00*; C12B *3/08*
U.S. Cl. 195—1.8 23 Claims

1. In the method of culturing mammalian cells in a culture medium which supplies nutrients including glucose to said mammalian cells:

The improvement of maintaining the glucose concentration in said culture medium at a desired concentration by providing sustained release of glucose at a controlled rate by including in the culture medium a compound containing an enzymatically-releasable glucosyl moiety and an enzyme activity capable of releasing glucose from said glucosyl-containing compound, said glucosyl-containing compound being present in an amount sufficient to provide sustained release of glucose and said enzyme activity being present at a level sufficient to maintain the glucose at the desired concentration.

3,926,724

PROCESS FOR THE PRODUCTION OF CITRIC ACID

Kenichiro Takayama, Machida; Tetsuo Adachi, Tokyo; Mamoru Kohata, Kawasaki; Kiyoji Hattori, Machida, and Tomoko Tomiyama, Tokyo, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1974, Ser. No. 452,405
Claims priority, application Japan, Mar. 24, 1973, 48-33089
Int. Cl. C12b *1/00*
U.S. Cl. 195—28 R 6 Claims

1. A process for the production of citric acid which comprises culturing a nutrition-requiring mutant yeast strain of the genus Candida in a culture medium containing assimilable sources of carbon and nitrogen and up to 500 mg/L of a source of iron ion or iron-containing ion, said mutant being characterized by requiring a higher amount of iron ion or iron-containing ion than its parent strain for comparable growth, accumulating citric acid in said culture medium and recovering said citric acid.

3,926,725

PROCESS FOR PRODUCING CYCLIC-3,5-CYTIDYLIC ACID BY FERMENTATION

Jiro Ishiyama, Noda, and Tamotsu Yokotsuka, Nagareyama, both of Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda, Japan

Filed June 7, 1974, Ser. No. 477,456
Claims priority, application Japan, June 8, 1973, 48-63918[U]
Int. Cl.[2] C12D *13/06*
U.S. Cl. 195—28 N 17 Claims

1. A process for producing cyclic-3′, 5′-cytidylic acid by fermentation, comprising culturing a microorganism belonging to the genus Corynebacterium, Arthrobacter or Microbacterium and having an ability of producing cyclic-3′, 5′-cytidylic acid in a medium containing a carbon source, a nitrogen source and inorganic nutrients under aerobic conditions at a pH of 5 to 9 at a temperature of 20° to 40°C for a period until cyclic-3′, 5′-cytidylic acid is produced and accumulated in the medium and isolating said cyclic-3′, 5′-cytidylic acid.

3,926,726

METHOD FOR CARRYING OUT ENZYMIC REACTIONS BY MEANS OF THE USE OF BIPHASIC AQUEOUS-ORGANIC SYSTEMS

Eraldo Antonini, Rome, Italy, and I.S.F. Societa per Azioni, 03, Trezzano Sul Naviglio, both of Italy, assignors to Snam Progetti S.p.A., Milan and I.S.F. Societa per Azioni, Trezzano Sul Naviglio, both of, Italy

Filed Jan. 11, 1974, Ser. No. 432,564

Claims priority, application Italy, Jan. 26, 1973, 19642/73

Int. Cl.² C12B *1/00*

U.S. Cl. 195—30 8 Claims

1. A method for carrying out enzymic conversions of water-insoluble substrates, wherein the enzyme is selected from the group consisting of laccase, hydroxosteroid dehydrogenase, lipase, lactic dehydrogenase and alcohol dehydrogenase, the operation is performed in aqueous organic biphasic systems in the presence of an organic solvent which is immiscible with water but is miscible with, and is, a solvent for the substrate.

3,926,727

UROKINASE PREPARATIONS

Edmond G. Vairel, Paris; Jean Goulay, Oissel, and Jean Choay, Paris, all of France, assignors to Choay S.A., Paris, France

Filed Sept. 25, 1972, Ser. No. 292,139

Claims priority, application France, Sept. 24, 1971, 71.34345; June 30, 1972, 72.23867; June 30, 1972, 72.23868

Int. Cl.² C07G *7/02*

U.S. Cl. 195—63 14 Claims

1. A urokinase-heparine complex comprising heparine complexed with highly purified urokinase, the complex having retained essentially the urokinase activity.

3,926,728

NEW PROCESS FOR THE PREPARATION OF 6-AMINOPENICILLANIC ACID

Eiji Kondo, Ikeda, and Takashi Mitsugi, Takaishi, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Aug. 19, 1974, Ser. No. 498,540

Claims priority, application Japan, Sept. 3, 1973, 48-99106[U]

Int. Cl.² C12D *9/22*

U.S. Cl. 195—36 P 11 Claims

1. A process for preparing 6-aminopenicillanic acid or a salt thereof which comprises (A) subjecting a penicillin or salt thereof to the penicillin amidase action of (1) a penicillin amidase-producing fungus of the genus *Phialomyces*, the genus *Leptosphaerulina* or the genus *Robillarda* or (2) the mycelium preparation resulting from said fungus, and (B) isolating the resultant 6-aminopenicillanic acid or salt thereof.

3,926,729

METHOD FOR PRODUCING DEACETYLCEPHALOSPORIN C

Toshihiko Kanzaki, Hyogo; Yukio Fujisawa, Osaka; Hideo Shirafuji; Kiyoshi Nara, both of Kyoto, and Masahiko Yoneda, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Apr. 10, 1973, Ser. No. 349,849

Claims priority, application Japan, Apr. 15, 1972, 47-38071

Int. Cl.² C12D *9/04*

U.S. Cl. 195—36 C 6 Claims

1. A method for producing deacetylcephalosporin C which comprises cultivating a microorganism which belongs to the genus *Cephalosporium* and is capable of producing directly deacetylcephalosporin C in a culture medium until deacetylcephalosporin C is accumulated in substantial amounts, and recovering deacetylcephalosporin C from the culture broth.

3,926,730

SEPARATION AND PURIFICATION OF ALPHA-AMYLASE

Fritz Hüper, and Erich Rauenbusch, both of Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Feb. 19, 1974, Ser. No. 443,723

Claims priority, application Germany, Feb. 24, 1973, 2309280

Int. Cl.² C07G *7/02*

U.S. Cl. 195—66 R 14 Claims

8. A process for the removal of α-amylase as an impurity in an enzyme preparation which comprises adsorbing the α-amylase from the enzyme preparation onto a carrier-bound α-amylase inhibitor to form an enzyme inhibitor complex, separating the complex, washing the complex, and recovering the desired enzyme from the solution substantially free from α-amylase as an impurity, the inhibitor being derived from wheat and bound to a carrier selected from the group consisting of a bead copolymer carrier of 70 mol % of tetraethylene glycol dimethacrylate, 20 mol % methacrylic acid, and 10 mol % maleic acid anhydride, an agarose activated with cyanogen bromide, and a copolymer of 4.7% N,N′-methylene-bis-acrylamide, 71.5% acrylamide and 23.8% maleic acid in anhydride form or the inhibitor being derived from a microbe of the genus Actinomyces and being bound to amino groups of an insoluble polymeric carrier by reaction with reactive groups introduced into the inhibitor by reaction with cyanogen bromide.

3,926,731

3-(5,7-DIMETHYL-2-HYDROXY-4-OXO-6,8-DECADIENYL)-GLUTARIMIDE FERMENTATION

Nakao Ishida, Sendai; Tsutomu Okada, and Akira Kamata, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Company, Ltd., Tokyo, Japan

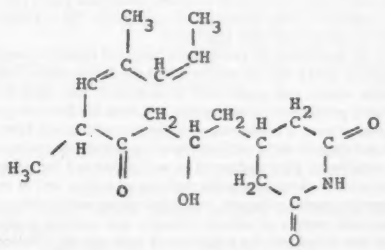
Division of Ser. No. 391,996, Aug. 27, 1973. This application Nov. 19, 1974, Ser. No. 525,222

Claims priority, application Japan, Aug. 25, 1972, 47-85074

Int. Cl.² C12D *9/00*

U.S. Cl. 195—80 R 4 Claims

1. The process of preparing 3-(5,7-Dimethyl-2-hydroxy-4-oxo-6, 8-decadienyl)-glutarimide , which has the structure:



which comprises cultivating *Streptomyces pluricolorescens* var. *yamashitaensis* (S-885) ATCC No. 21956 in an aqueous nutrient broth containing a carbohydrate source and a source of organic nitrogen until said broth achieves substantial antiviral activity, and recovering said antibiotic from said culture broth.

3,926,732

METHOD FOR ASSAYING CATALASE IN MILK AND OTHER LIQUIDS

Ernst Anders Carl-Gustaf Rosen, and Helena Mariana Rosen, both of Huddinge, Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Feb. 14, 1974, Ser. No. 442,346
Claims priority, application Sweden, Feb. 16, 1973, 22014
Int. Cl.[2] C12K *1/04*
U.S. Cl. 195—103.5 R 16 Claims

1. A method for qualitative and quantitative determination of catalase in a liquid, said method comprising the steps of adding to the liquid a first reagent comprising a substance which releases hydrogen peroxide in the presence of another substance in said liquid, adding to the liquid a second reagent oxidizable by hydrogen peroxide to yield a color reaction, said oxidation by hydrogen peroxide being inhibited by the presence of catalase, whereby said color reaction is stronger with a smaller catalase content of the liquid, and determining the catalase content with the aid of the hue of the color thus produced.

3,926,733

METHOD OF CONTINUOUS AUTOMATIC INCUBATION OF BACTERIA AND DETERMINATION OF GROWTH THEREOF, AND APPARATUS THEREFOR

Ichiro Chibata, Suita; Hiroshi Ito, Itami; Tomoaki Morimoto, Suita; Yukio Taniguchi, Toyonaka, and Tsuneo Fujimoto, Amagasaki, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Sept. 21, 1973, Ser. No. 399,309
Claims priority, application Japan, Sept. 27, 1972, 47-96734; Sept. 27, 1972, 47-96735
Int. Cl.[2] C12B *1/00*
U.S. Cl. 195—103.5 5 Claims

3. A method for continuous bacterial culture and the determination of the growth thereof, wherein sample solution, culture medium, and inoculum are automatically supplied to test tubes freely suspended inholders which are rotatable around a horizontal axis, the holders being supported by and slidable on a guide rail within an aseptic, constant temperature chamber, sliding said holders holding said test tubes around said guide rail by suitable drive means, cyclically striking said test tubes by striking there against at least one bar by moving the bar reciprocally on a certain level for imparting an oscillatory motion to said test tubes and shaking the contents thereof, and repeatedly determining the bacterial growth in said test tubes at a certain location along said guide rail without removal of said holders from said guide rail or removal of said contents from said test tubes.

5. An apparatus for continuous bacterial culture comprising a zig-zag guide rail, an aseptic constant temperature chamber within which said guide rail is mounted, test tube holders slidably positioned on said guide rail, said holders being oscillatable around a horizontal axis for permitting test tubes suspended therefrom to oscillate freely, advance means provided at suitable locations adjacent to said guide rail for advancing said holders along said guide rail one at a time and at regular intervals, means adjacent one point along said guide rail for automatic supply of sample solution and culture medium to said test tubes and for injection of said sample solution and culture medium with inoculum, a holding station at a further point along said guide rail having means for holding test tubes stationary and determining the bacterial growth in the test tubes without removal of said contents from said test tubes, bars extending parallel to certain portions of said guide rail, and drive means connected to said bars for driving said bars in a reciprocating motion along a certain level for cyclically striking test tubes freely suspended in said holders along said guide rail, whereby contents of said test tubes are shaken and bacterial growth therein is accelerated.

3,926,734

UREA ANALYSIS

Don N. Gray; Melvin H. Keyes, both of Sylvania, and Frank E. Semersky, Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 21, 1973, Ser. No. 427,322
Int. Cl.[2] C12K *1/04*
U.S. Cl. 195—103.5 R 13 Claims

1. A method for determining urea in an aqueous specimen containing urea, comprising the sequential steps of:
passing said specimen into a hydrolysis zone containing immobilized urease,
retaining said specimen in said hydrolysis zone for a time sufficient to hydrolyze said urea to ammonium ions,
removing the resulting hydrolysis mixture from said hydrolysis zone,
raising the pH of said hydrolysis mixture to at least about 11 to convert substantially all of said ammonium ions to an aqueous ammonia solution,
contacting said aqueous ammonia solution with a hydrophobic, ammonia permeable membrane for a time sufficient to allow gaseous ammonia to permeate said membrane,
determining the gaseous ammonia permeating said membrane by dissolving said ammonia in an electrolyte and potentiometrically determining the resulting increase in pH of said electrolyte, and
converting said ammonia determination to the urea equivalent of said specimen.

3,926,735

ALKALINE PHOSPHATASE ASSAY

Alexander A. Monte, and Ching Chiang, both of Glendora, Calif., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 200,552, Nov. 19, 1971, Pat. No. 2,816,262, which is a continuation-in-part of Ser. No. 190,883, Oct. 20, 1971, abandoned. This application May 6, 1974, Ser. No. 467,319
Int. Cl.[2] C01N *31/14*
U.S. Cl. 195—103.5 R 12 Claims

7. The method of assaying a biological specimen for alkaline phosphatase using a plurality of solid, water-soluble, substantially anhydrous, storage-stable reagent formulations respectively comprising:
1. a chromogenic reagent formulation containing:
a. sodium molybdate;
b. sodium lauryl sulfate; and
c. a nitrogen-containing polyoxyalkylene nonionic surfactant obtained by the sequential reaction of ethylenediamine with propylene oxide and ethylene oxide in the presence of a catalyst, said surfactant containing polyoxypropylene chains having an average molecular weight of between about 750 and about 6750 and polyoxyethylene chains constituting between about 10 and about 80 weight percent of said surfactant;
2. a reducer quench reagent formulation containing:
a. L-ascorbic acid;
b. sulfamic acid; and
c. said nitrogen-containing polyoxyalkylene nonionic surfactant; and
3. a buffer substrate reagent formulation containing:
a. β-glycerophosphoric acid disodium salt;
b. tris-(hydroxymethyl)-aminomethane;
c. succinic acid;
d. sodium lauryl sulfate; and
e. said nitrogen-containing polyoxyalkylene nonionic surfactant;
the method comprising the steps of:
i. dissolving each of said reagent formulations in separate portions of water to produce a plurality of liquid reagents;
ii. preheating an aliquot of predetermined volume of the liquid reagent containing said buffer substrate

reagent formulation for a predetermined period of time;

iii. mixing the preheated aliquot of said liquid reagent containing said buffer substrate reagent formulation with a biological specimen to form a specimen/reagent test system;

iv. maintaining the specimen/reagent test system at a predetermined elevated temperature for a predetermined period of time;

v. adding both the liquid reagent containing said chromogenic reagent formulation and the liquid reagent containing said reduced quench reagent formulation to said system;

vi. thereafter maintaining said system at a predetermined elevated temperature for a further predetermined period of time; and

vii. measuring the optical density of said system resulting from the interaction between said reagents and said specimen.

3,926,736

ENZYMATIC ETHANOL ASSAY

Giovanni Bucolo, Irvington, N.Y., assignor to Calbiochem, La Jolla, Calif.

Filed Aug. 30, 1974, Ser. No. 502,210
Int. Cl.² C12K *1/04*
U.S. Cl. 195—103.5 R **7 Claims**

1. A composition of matter useful as a reagent in determining the ethanol content of body fluids consisting essentially of:

a. the enzyme alcohol dehydrogenase;

b. the coenzyme nicotinamide adenine dinucleotide;

c. a buffer/acetaldehyde-trapping agent selected from the group consisting of 2-amino-2-hydroxymethyl-1,3-propanediol, 2-amino-2-methyl-1,3-propanediol and mixtures thereof;

d. an acid in quantity sufficient to lower the pH of an aqueous solution of said mixture to within the range of about 8.8 to 9.2;

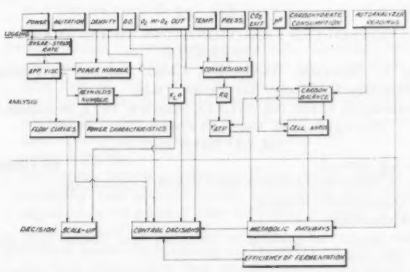
said mixture being free of any other acetaldehyde trapping agent.

3,926,737

METHOD AND APPARATUS FOR CONTROL OF BIOCHEMICAL PROCESSES

John D. Wilson, Mertztown; Laszlo K. Nyiri, Bethlehem; Arthur E. Humphrey, Media, and Clyde S. Harmes, III, Schnecksville, all of Pa., assignors to New Brunswick Scientific Co., Inc., New Brunswick, N.J.

Division of Ser. No. 251,959, May 10, 1972. This application Sept. 24, 1973, Ser. No. 399,036
Int. Cl.² C12B *1/00*
U.S. Cl. 195—108 **7 Claims**



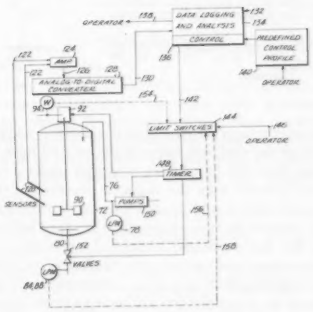
1. A method for analysis and control of biochemical processes comprising detecting the values of selected controllable and dependent variables at at least periodic intervals in said biochemical process; calculating by means of a computer at least one further, not directly measurable dependent variable on a real-time, on-line basis from said plurality of selected controllable and dependent variables, said further, not directly measurable dependent variable being representative of the stage of the biochemical process; and interactively regulating the values of said controllable variables in response to said calculated values of said further dependent variable to bring said further dependent variable to predetermined levels to create the desired environmental conditions for the biochemical process.

3,926,738

METHOD AND APPARATUS FOR CONTROL OF BIOCHEMICAL PROCESSES

John D. Wilson, Mertztown; Laszlo P. Nyiri, Bethlehem; Arthur E. Humphrey, Media, and Clyde S. Harmes, III, Schnecksville, all of Pa., assignors to New Brunswick Scientific Co., Inc., New Brunswick, N.J.

Filed May 10, 1972, Ser. No. 251,959
Int. Cl.² C12B *1/00*
U.S. Cl. 195—127 **9 Claims**



1. An apparatus for control of biochemical processes comprising vessel means within which said process is to be performed; means for adding controlled amounts of substances required for said process into said vessel means; means for monitoring a plurality of predetermined controllable and dependent variables in said process; calculating means for calculating at least one further, not directly measurable dependent variable representative of the status of the biochemical process on a real-time, on-line basis from said detected controllable and dependent variables; and control means for interactively regulating the values of said controllable variables in response to said calculated values of said further dependent variable to bring said further dependent variable to predetermined levels to create the desired environmental conditions for the biochemical process.

3,926,739

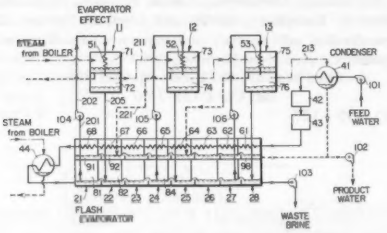
MULTIPLE-EFFECT MULTI-STAGE FLASH EVAPORATION PROCESS AND APPARATUS FOR DEMINERALIZING WATER

Kenkichi Izumi, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 15, 1974, Ser. No. 497,624
Claims priority, application Japan, Aug. 15, 1973, 48-90878
Int. Cl.² B01D *1/28, 1/26, 3/02, 3/00*
U.S. Cl. 202—173 **10 Claims**

1. A desalting process for feed saline water containing scale forming materials including calcium sulfate, wherein saline water fed to multiple evaporator effects is preheated in multistage flash evaporators having flash chambers, and is evaporated and concentrated in the multiple evaporator effects to produce desalted water, which process comprises: flashing feed salt water in a first flash evaporator under a reduced

pressure to product vapor and brine, while transferring the latent heat of the vapor to the feed saline water by indirect heat exchange therewith and simultaneously condensing the vapor to produce product desalted condensate, all at a temperature above which anhydrite calcium sulfate precipitates; evaporating a portion of the brine from the first flashing step in a first evaporator effect by the latent heat of condensation of other vapor to produce further vapor from said portion of the first brine to produce enriched brine, while condensing the other vapor to produce other condensate, all at a temperature above which anhydrite calcium sulfate precipitates; introducing the enriched brine produced in said evaporating step directly into the flashing chamber of a second flash evaporator



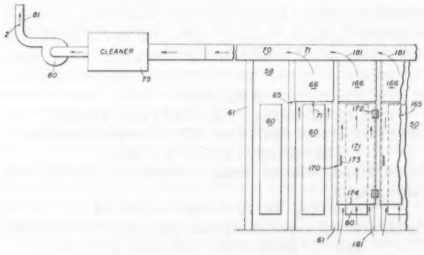
without passing through the first flash evaporator; additionally flashing at least the enriched brine in the second flash evaporator separate from the first flash evaporator under a reduced pressure that is lower than the reduced pressure of the first flashing step to produce additional vapor and further enriched brine and by indirect heat exchange with the feed saline water condensing the thus produced additional vapor into product desalted condensate; and directing the further vapor produced in said evaporating effect step into a subsequent evaporator effect maintained at a pressure and temperature lower than the first evaporator effect and transferring the vapor produced in said first effect along with its latent heat of condensation into indirect heat exchange with brine from a flash evaporator other than the first flash evaporator.

3,926,740

CONTROL OF COKE OVEN DOOR EMISSIONS

Frederick G. Krikau, Dolton, Ill., assignor to Interlake, Inc., Chicago, Ill.

Filed Mar. 22, 1974, Ser. No. 453,679
Int. Cl.[2] C10B *33/00*
U.S. Cl. 202—261 **5 Claims**



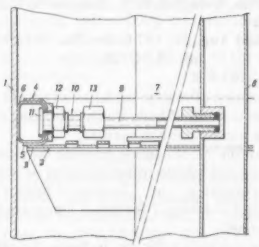
1. A pollution control system for collecting emissions from coke ovens through the doors thereof produced during the coking of coal, said system comprising a plurality of chimneys corresponding in number to the number of coke ovens, each chimney being positioned outside of the associated coke oven and having as part of one wall thereof the associated coke oven door and having spaced-apart buckstays generally normal and fixed to the coke oven wall door as side walls thereof and a wall maintained on said buckstays parallel and separated from the coke oven door, the bottom of the chimney being open to create a draft flowing upwardly adjacent to the coke oven door, a manifold connected to each of said chimneys to collect emissions from the coke ovens conveyed by the drafts flowing upwardly through said chimneys and into said manifold, and a cleaner connected to a source of reduced pressure and to said manifold for treating the emissions flowing upwardly through said chimneys and into said manifold to remove pollutants therefrom, whereby emissions escaping from the coke ovens through the doors flow upwardly through said chimneys into said manifold and into said cleaner to be treated therein thereby preventing pollution of the atmosphere.

3,926,741

COLUMN DEVICE

Erich Bertsch, Lorrach (Baden), Germany, assignor to Lonza Ltd., Gampel/Valais, Basel, Switzerland

Filed Jan. 30, 1974, Ser. No. 437,940
Int. Cl.[2] C10B *29/00*, *45/00*
U.S. Cl. 202—269 **10 Claims**



1. An assembly comprising a cylindrical column having an interior wall, a plurality of removable axially spaced separating floors extending laterally across the interior of said column adjacent said wall, seal retaining means fixed to said floors at a location thereon proximate said wall, sealing means compressed between said interior wall and said seal retaining means to provide a fluid tight seal therebetween, said sealing means comprising a hollow ring formed of material capable of being inflated and deflated by introduction of fluid under pressure thereinto extending circumferentially completely about the interior of said column, and fluid supply means for inflating said sealing means to an internal pressure greater than pressure existing against the exterior of said sealing means, and for deflating said means to facilitate removal of said floors from within said column.

3,926,742

CONTROLLED FRACTIONATION METHOD AND APPARATUS

John E. Anderson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 231,813, March 6, 1972, abandoned.
This application Aug. 1, 1974, Ser. No. 493,916
Int. Cl.[2] B01D *3/42*
U.S. Cl. 203—3 **15 Claims**

1. A controlled fractionation system comprising:
a fractionation means;
an absorber;
first means for passing an absorber feed stream into said absorber;
second means for passing a second absorption medium stream into said absorber;
third means for removing an absorber overhead stream from said absorber;
fourth means for removing an absorber bottoms product stream from said absorber and passing said absorber

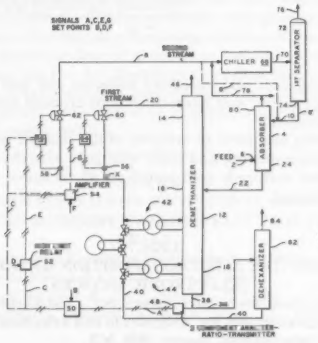
bottoms product stream into the intermediate portion of said fractionation means as feed to be fractionated;

fifth means for passing a first absorption medium stream into the upper portion of said fractionation means;

sixth means for removing a fractionator overhead product stream from the upper portion of said fractionation means;

seventh means for removing a fractionator bottoms product stream from the lower portion of said fractionation means;

analyzing-ratioing-transmitting means for measuring the concentration of first and second components in said fractionator bottoms product stream and delivering a signal A responsive to the ratio of one of said components to the other;



eighth means for dividing said fractionator bottoms product stream into an end product stream, said first absorption medium stream, and said second absorption medium stream;

ninth means for measuring the flow rate of said first absorption medium stream and delivering a first flow rate signal responsive thereto;

tenth means for measuring the flow rate of said second absorption medium stream and delivering a second flow rate signal responsive thereto;

eleventh means for producing a control signal, said eleventh means comprising an analysis controller having a set point B representative of the desired value of said ratio and being connected to the analyzing-ratioing-transmitting means for receiving signal A, comparing said signal A to the set point B, and delivering said control signal in response to said comparison;

twelfth means for receiving said control signal and one of said first and second flow rate signals and controlling the flow rate of the respective first or second absorption medium stream associated with said one of said first and second flow rate signals in response to a comparison of said control signal and said one of said first and second control signals;

a ratio relay having a set point F and being adapted for receiving said control signal, multiplying said control signal by a set point F and delivering a signal G in response to said multiplication; and

thirteenth means for receiving said signal G and the remaining one of said first and second flow rate signals not received by said twelfth means and controlling the flow rate of the remaining first or second absorption medium stream not controlled by said twelfth means in response to a comparison of said signal G with said remaining one of said first and second flow rate signals.

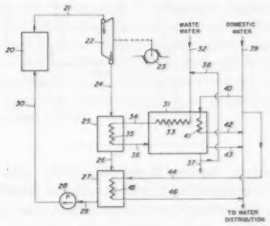
3,926,743
DISPOSAL OF WASTE HEAT

Allen Cywin, Alexandria, Va., assignor to The United States of America as represented by the United States Environmental Protection Agency, Washington, D.C.

Division of Ser. No. 110,430, Jan. 28, 1971, Pat. No. 3,760,868. This application Sept. 24, 1973, Ser. No. 400,106

Int. Cl.[2] B01D *3/00, 3/10*

U.S. Cl. 203—10 **3 Claims**



1. A process for reducing thermal pollution of surface waters which comprises:

extracting waste heat from a thermal power generation process by passing a relatively cold, nonpotable waste water stream in indirect contact heat exchange with a hotter stream comprising low pressure turbine exhaust stream to thereby cool and condense at least a portion of the exhaust steam and to heat the nonpotable water stream;

distillating the heated, nonpotable waste water stream to recover a hot, potable water product stream and a concentrated waste stream;

rejecting heat from the waste water distillation by passing a relatively cold, potable, domestic water stream in indirect contact heat exchange with the distilling waste water at the lowest temperature level of the distillation step, thereby warming the domestic water stream;

passing the warmed domestic water stream into a domestic water distribution system which comprises a substantial length of underground mains and laterals, and

discharging by indirect heat exchange at least a portion of the extracted waste process heat to the soil mass surrounding the mains and laterals.

3,926,744
PROCESS FOR THE RECOVERY OF ACRYLIC ACID AND ACROLEIN

Ewald Noll, Grosskrotzenburg; Hans Schaefer, Grossauheim; Horst Schmid, Wesseling, and Wolfgang Weigert, Offenbach, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed Dec. 26, 1973, Ser. No. 428,304

Claims priority, application Germany, Dec. 27, 1972, 2263496

Int. Cl.[2] B01D *3/34, 3/00*

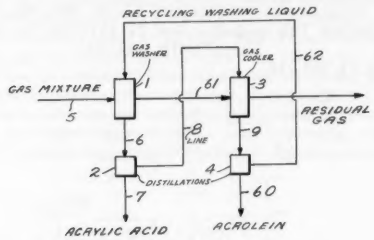
U.S. Cl. 203—55 **7 Claims**

1. In a process for the recovery of acrylic acid and acrolein from the gas mixture resulting from the catalytic gas phase oxidation of propylene or acrolein by washing the gas mixture with a liquid in which at first the acrylic acid is dissolved at higher temperature and then the acrolein is dissolved at lower temperature, the improvement comprising:

1. washing the gas mixture for the separation of the acrylic acid at temperatures from 60° to 130° C. with a washing liquid which is a mixture of water and organic liquid; and then

2. washing the gas mixture with a washing liquid which is water or a mixture of water and organic liquid at temperatures between 0° and 30° C., said organic liquid in steps

(1) and (2) having a higher boiling point than acrylic acid, forming an azeotrope with water alone, but not forming as axeotrope with acrolein or a mixture of water

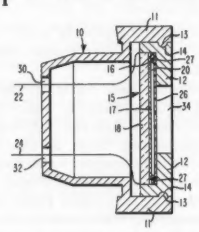


and acrolein, having slight miscibility with water and forming a solution with acrylic acid in which the acrylic acid has an activity coefficient of less than about 1.5.

3,926,745
DEPOSITION OF P_2O_5 IN AN ELECTROLYTIC MOISTURE CELL

Michael Czuha, Jr., San Gabriel, Calif., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 281,859, Aug. 18, 1972, abandoned. This application Apr. 9, 1974, Ser. No. 459,324
Int. Cl.² H01M 4/86
U.S. Cl. 204—1 T **16 Claims**



1. A method of depositing phosphorus pentoxide on an electrically nonconductive substrate disposed between two electrodes comprising the steps of:

a. contacting said electrodes and said substrate, in the presence of water vapor, with gaseous phosphorus; and

b. applying an electric potential between said electrodes of sufficient strength to electrolyze the water vapor and form phosphorus pentoxide on said substrate only in the region between said electrodes.

3,926,746
ELECTRICAL INTERCONNECTION FOR METALLIZED CERAMIC ARRAYS

Billy M. Hargis, Cleveland, Tenn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 4, 1973, Ser. No. 403,404
Int. Cl.² B41M 3/08
U.S. Cl. 204—15 **7 Claims**

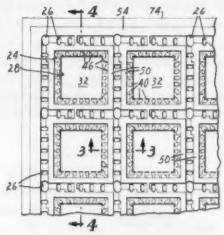
1. The process for providing uniform gold plating to ceramic substrates having multiplicities of internal and external terminals and internal pads comprising the steps of

I. constructing an array of said substrates having an at least partial margin of ceramic from at least one sheet of fired or unfired ceramic having desired patterns of metallization for said substrates thereon, said array comprising;

A. spaces at least between said substrates and between substrates and margins for separation of said substrates from one another and from margins of said array along predetermined lines of separation, said array further comprising

B. at least one metallized collector and

C. interconnections between external terminals of adjacent substrates and between pads of adjacent substrates and between external terminals and pads of substrates



adjacent said metallized collector and said metallized collector, said interconnections crossing lines of separation,

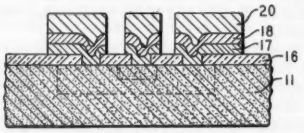
II. firing said array to maturity of the ceramic and

III. electroplating said array with gold whereby a ceramic array uniformly gold plated on all receptive surfaces is obtained.

3,926,747
SELECTIVE ELECTRODEPOSITION OF GOLD ON ELECTRONIC DEVICES

Kenneth Russ Newby, Greensboro, N.C., and Earl Dallas Winters, Quakertown, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 19, 1974, Ser. No. 443,624
Int. Cl.² C25D 5/02, 5/10
U.S. Cl. 204—15 **9 Claims**



1. A method of electrodepositing from solution a gold layer onto a platinum of palladium layer, where the platinum or palladium layer covers portions of a titanium layer, leaving portions of the titanium layer exposed to the solution, characterized in that the titanium layer is biased cathodic with respect to an immersed counter electrode, such that the cathode potential at the titanium layer does not exceed a maximum value during electrodeposition, whereby the gold selectively deposits substantially only on the platinum or palladium layer.

3,926,748
ELECTRODEPOSITION OF GOLD-ANTIMONY ALLOYS AND COMPOSITIONS THEREFOR

Lewis Brian Lerner, Linglestown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed June 28, 1974, Ser. No. 484,004
Int. Cl.² C25D 3/62
U.S. Cl. 204—43 G **4 Claims**

1. An electrolyte for electrodeposition of a gold antimony alloy from an aqueous solution at a pH of 6.8 to 7.3 consisting essentially of (a) dibasic potassium phosphate, from 100 to 200 grams/liter, (b) monobasic potassium phosphate, from 30 to 60 grams/liter, potassium tartrate, from 5 to 50 grams/liter,

gold as KAu_2, from 8 to 17 grams/liter, and antimony potassium tartrate, from .1 to 1 grams/liter and wherein *a* to *b* is 70 to 75% on hydrous basis to anhydrous basis, by weight, respectively.

3,926,749

TIN-LEAD ALLOY PLATING

Frank Passal, Detroit, Mich., assignor to M&T Chemicals Inc., Greenwich, Conn.

Continuation of Ser. No. 210,148, Dec. 20, 1971, abandoned. This application Jan. 16, 1975, Ser. No. 541,432

Int. Cl.² C25D *3/56, 3/60*

U.S. Cl. 204—43 S **28 Claims**

15. A composition for providing white, continuous, fine-grained tin-lead alloy electrodeposits which comprises an aqueous acidic bath composition consisting of at least one water soluble stannous tin salt, at least one water soluble lead salt providing about 1.0 gram per liter to 85.0 grams per liter of lead and containing as cooperating additives 4 grams per liter to 12 grams per liter of at least one polyether surfactant and 0.5 gram per liter to 1.0 gram per liter of at least one aryl hydroxy (—OH) compound selected from the group consisting of naphthols and substituted phenols, in the absence of other brightening agents.

3,926,750

DETECTION SYSTEM FOR PROTECTING ANODES IN FLOWING MERCURY CATHODE ELECTROLYTIC CELLS

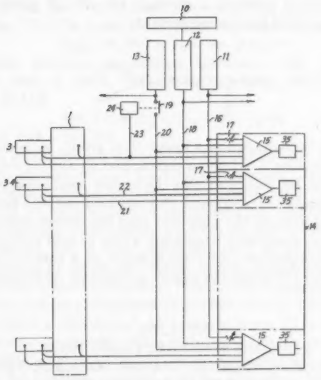
Yoichi Adachi, and Yoshiharu Harada, both of Tokyo, Japan, assignors to Mitsui & Co. Ltd., Tokyo, Japan

Filed Sept. 8, 1972, Ser. No. 287,490

Claims priority, application Japan, Sept. 13, 1971, 46-71019

Int. Cl.² C25B *1/40, 15/04, 15/06*

U.S. Cl. 204—99 **7 Claims**



1. Method for protecting anodes in a horizontal mercury cell by adjusting the distance between a plurality of anodes and the flowing mercury cathode in the cell for electrolyzing a conductive solution wherein each of said anodes are adjustably suspended in said solution, which method comprises detecting the flow of current in a bus line of each anode to provide a first output signal, detecting voltage between each anode and the flowing mercury cathode to provide a second output signal, combining said first and second signals to generate a summation signal, generating an output signal when said summation signal exceeds a predetermined value, and energizing means for adjusting the distance between said anode and the cathode.

2. In an electrolytic cell for electrolyzing a conducting solution, said cell comprising a plurality of anodes having bus bars and a flowing mercury cathode, the improvement wherein control means are present for adjusting the anode-cathode spacing for each anode, said control means comprising means for detecting the flow of current in a bus line of each anode to provide a first output signal, means for detecting a voltage between each anode and the flowing mercury cathode to provide a second output signal, means for combining said first and second signals to generate a summation signal, means for generating a reference signal, means for comparing said summation signal and said reference signal, means for generating an output signal signal when the difference between said summation signal and said reference signal exceeds a predetermined amount, and means energized by said output signal for either signaling or adjusting the anode-cathode spacing.

3,926,751

METHOD OF ELECTROWINNING METALS

Oronzio De Nora; Giuseppe Bianchi; Antonio Nidola, and Giovanni Trisoglio, all of Milan, Italy, assignors to Electronor Corporation, Panama City, Panama

Division of Ser. No. 361,022, May 17, 1973, Pat. No. 3,878,083. This application Jan. 31, 1975, Ser. No. 546,112

Claims priority, application Italy, May 18, 1972, 24526/72

Int. Cl.² C25C *1/00;* **C25B** *11/08*

U.S. Cl. 204—105 R **6 Claims**

1. A method of electrowinning metals comprising passing an electric current through an anode having an electro-conductive base provided with a coating over at least a portion of its outer surface of a mixed material of tantalum oxide and iridium oxide, then an acid aqueous electrolyte containing the metal to be electrowinned and then the cathode on which the electrowinned metal is deposited, the ratio of tantalum or iridium calculated as metal is 7:1 to 0.34 to 1.

3,926,752

DIRECT RECOVERY OF METALS FROM SULPHIDE ORES BY LEACHING AND ELECTROLYSIS

John C. Loretto, 4649 - 248th St., Aldergrove, British Columbia, and Kenneth E. N. Hanney, 1402 Evelyn St., North Vancouver, British Columbia, both of Canada

Filed Apr. 4, 1974, Ser. No. 457,898

Claims priority, application United Kingdom, Apr. 9, 1973, 16920/73

Int. Cl. C25c *1/12, 1/06*

U.S. Cl. 204—107 **6 Claims**

1. A process for the direct recovery of copper from its ores and concentrates which comprises agitating a slurry of finely ground copper sulfide-containing ore or concentrate in a solution of ferric chloride and hydrochloric acid in the anode compartment of an electrolytic cell, said cell having first and second cathode compartments and an anode compartment, the cathode compartments being separated from the anode compartment by diaphragms preventing the movement of solids and liquids but allowing the passage of ions therethrough, removing and filtering the leached slurry to remove sulfur-containing solids therefrom and leaving a filtrate containing cuprous chloride and ferrous chloride, feeding the filtrate to the first cathode compartment in the cell and depositing copper metal from the filtrate on to a first cathode, releasing chloride ions in the first cathode compartment and forming a copper-poor spent electrolyte, substantially eliminating residual copper and any ferric iron from the copper-poor electrolyte to form a solution containing ferrous chloride, feeding the ferrous chloride solution to the second cathode compartment in the cell, depositing iron metal from the solution on to a second cathode, forming an iron-poor spent electrolyte and releasing chloride ions in the second cathode compartment, the chloride ions released in the cathode compartments migrating therefrom to the anode compartment to be liberated as chlorine gas at the anode, oxidizing ferrous

iron with said chlorine gas in the anode compartment, returning the iron-poor electrolyte to the anode compartment, recovering copper metal from the first cathode and recovering iron metal from the second cathode.

3,926,753

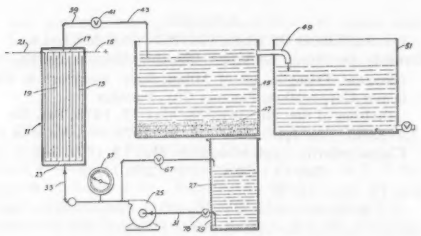
ELECTROCHEMICAL REMOVAL OF FLUORIDE ION FROM AQUEOUS MEDIA

Sung Ki Lee, E. Amherst, N.Y., assignor to Andco Incorporated, Buffalo, N.Y.

Continuation-in-part of Ser. No. 332,884, Feb. 16, 1973, which is a continuation-in-part of Ser. No. 225,417, Feb. 11, 1972, Pat. No. 3,766,037. This application Mar. 11, 1974, Ser. No. 449,825

Int. Cl.[2] C02B *1/82*

U.S. Cl. 204—149 **6 Claims**



1. A method for electrochemically removing from an ionizing medium a fluoride ion which is capable of forming an insoluble aluminum compound or complex, which comprises passing an electric current between an anode which has a surface or a portion of a surface thereof of aluminum, aluminum alloy or insoluble aluminum compound, and a cathode, through the ionizing medium containing the fluoride ion to be removed, so as to produce an insoluble aluminum compound or complex with the fluoride ion, and removing such insoluble material from the ionizing medium.

3,926,754

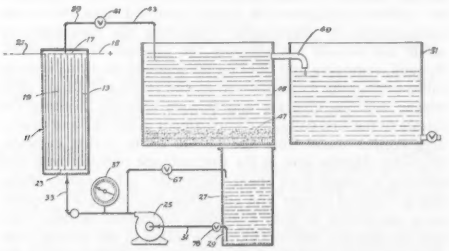
ELECTROCHEMICAL CONTAMINANT REMOVAL FROM AQUEOUS MEDIA

Sung Ki Lee, Amherst, N.Y., assignor to Andco Incorporated, Buffalo, N.Y.

Continuation-in-part of Ser. No. 225,417, Feb. 11, 1972, Pat. No. 3,776,037. This application Feb. 16, 1973, Ser. No. 332,884

Int. Cl. C02c *5/12;* **B01k** *1/00*

U.S. Cl. 204—152 **20 Claims**



1. A method for electrochemically removing from an ionizing medium a contaminant ion which is capable of forming an insoluble iron compound or complex, which comprises passing an electric current through the ionizing medium containing the ion to be removed between an anode which has a surface or a portion of a surface thereof of iron, iron alloy or insoluble iron compound, and a cathode so as to produce anodically an insoluble iron compound, species or complex in said ionizing medium while cathodically reacting said contaminant ion with the ionizing medium to generate an insoluble hydroxide thereof and whereby an insoluble iron compound or complex with the contaminant ion is produced, and removing said insoluble iron compound or complex with the contaminant ion from the ionizing medium.

3,926,755

RADIATION POLYMERIZABLE POLYESTER COMPOSITION

Nelson S. Marans, and Alfred Gluecksman, both of Silver Spring, Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 398,317, Aug. 17, 1973, abandoned. This application June 21, 1974, Ser. No. 481,732

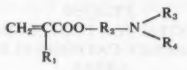
Int. Cl.[2] C08F *2/48;* **C08L** *67/06, 67/00*

U.S. Cl. 204—159.15 **14 Claims**

1. A process for curing a radiation curable composition consisting essentially of an intimate mixture of;

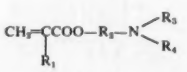
a. 35–85 parts of a polyester of an ethylenically unsaturated polycarboxylic acid and a polyhydric alcohol; and

b. 15–65 parts of an amino compound having the formula



in which R_1 is hydrogen or a lower alkyl group, R_2 is an alkylene group having 2–8 carbon atoms, and R_3 and R_4 are lower alkyl groups, the polyester plus the amino compound totaling 100 parts, said process comprising irradiating said composition with 0.05–2 Mrads of high energy ionizing radiation.

7. A process for curing a radiation curable composition consisting essentially of an intimate mixture of; (a) 35–85 parts of polyester of an ethylenically unsaturated polycarboxylic acid and a polyhydric alcohol; (b) 15–65 parts of an amino compound having the formula



in which R_1 is hydrogen or a lower alkyl group, R_2 is an alkylene group having 2–8 carbon atoms, and R_3 and R_4 are lower alkyl groups, the polyester plus the amino compound totaling 100 parts; and (c) 0.1–5 parts of a photocuring rate accelerator per 100 parts of the polyester plus the amino compound, said process comprising irradiating a film of said composition with actinic light for 0.001–60 minutes at a rate to provide about 0.0001–20 watts per square centimeter of film surface.

3,926,756

PROCESS FOR PREPARING HIGH MOLECULAR-WEIGHT, WATER SOLUBLE VINYL POLYMERS BY IRRADIATION

Alfred J. Restaino, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

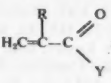
Continuation of Ser. No. 781,975, Dec. 6, 1968, abandoned. This application Nov. 18, 1971, Ser. No. 200,195

Int. Cl. C08f *13/00, 1/16, 3/44*

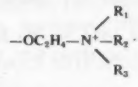
U.S. Cl. 204—159.22 **12 Claims**

1. A process for preparing an aqueous gel of a water-soluble, high molecular weight copolymer, wherein the copolymer has an intrinsic viscosity of at least 6 deciliters per gram as measured in 2 normal sodium chloride solution at 25.5°C., which comprises irradiating with high energy ionizing radiation at an intensity of from 250 rads to 200,000 rads per hour to a dose of from 1,000 to 200,000 rads, an ammonia free aqueous solution having a pH from about 3 to about 13 and

containing from 10% to 45% concentration by weight of (1) at least two monomers conforming to the formula



(2) a mixture of at least one of said monomers with at least one of acrylic acid, vinyl sulfonic acid, water-soluble salt of acrylic acid, or water-soluble salt of vinyl sulfonic acid, said mixture containing at least 15% by weight of said monomer; (3) a mixture of at least one of said monomers with up to 25% of its own weight of acrylonitrile; or (4) a mixture of at least one of said monomers, acrylic acid, or a water-soluble salt thereof, and acrylonitrile containing at least 15% by weight of said monomer and no more than 25% by weight of acrylonitrile, wherein Y is $-NH_2$ or



wherein R is hydrogen or methyl, R_1, R_2, and R_3 are 1 to 4 carbon alkyl radicals and X^- is an anion, to form an aqueous gel of a water-soluble, high molecular weight copolymer having an intrinsic viscosity of at least 6 deciliters per gram in 2 normal sodium chloride solution at 25.5°C.

3,926,757

PROCESS FOR PREPARING STRAIGHT-CHAIN ALIPHATIC AND CYCLO-ALIPHATIC SULFONIC ACIDS

Sigurd Rosinger, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 105,545, Jan. 11, 1971, abandoned, which is a continuation-in-part of Ser. Nos. 651,785, July 7, 1967, abandoned, Ser. No. 663,749, Aug. 28, 1967, abandoned, Ser. No. 673,061, Oct. 5, 1967, abandoned, and Ser. No. 721,370, April 15, 1968, abandoned. This application Aug. 29, 1973, Ser. No. 392,485

Claims priority, application Germany, July 21, 1966, 49753; Sept. 9, 1966, 50173; Oct. 14, 1966, 50432; Sept. 6, 1967, 53418

Int. Cl. B01j *1/10;* **C07c** *13/02*

U.S. Cl. 204—162 HE **10 Claims**

1. In a continuous process for the production of sulfonic acids by reaction of $C_{10}-C_{30}$ saturated straight chain aliphatic hydrocarbons, sulfur dioxide and oxygen wherein the reaction is started by introduction of ozone into the reaction mixture or introduction of an organic peroxy compound into the reaction mixture and is then continued with or without further introduction of ozone or organic peroxy compound, the improvement which comprises: feeding continuously a liquid reaction mixture obtained from the sulfoxidation to an extraction mixture consisting of, on a weight basis, 25 to 45% $C_{10}-C_{30}$ saturated, straight chain aliphatic hydrocarbons, 20 to 40% sulfonic acids, 10 to 30% water and 4 to 8% sulfuric acid; mixing the reaction mixture with the extraction mixture and then feeding water to said extraction zone to keep constant the ratio of components of the extraction mixture and removing from said extraction zone as a heavy phase an extract having the same ratios and ingredients as given for the extraction mixture, and as a light phase C_{10}–C_{30} saturated straight chain aliphatic hydrocarbons containing not more than 0.02 weight percent of water and recycling these hydrocarbons without further treatment to the reaction zone.

2. In a continuous process for the production of sulfonic acids by reaction of $C_{10}-C_{30}$ saturated straight chain aliphatic hydrocarbons, sulfur dioxide and oxygen wherein the reaction is started by irradiation of the reaction mixture and is then continued with or without further irradiation, the improvement which comprises: feeding continuously a liquid reaction mixture obtained from the sulfoxidation to an extraction mixture consisting of, on a weight basis, 25 to 45% $C_{10}-C_{30}$ saturated, straight chain aliphatic hydrocarbons, 20 to 40% sulfonic acids, 10 to 30% water and 4 to 8% sulfuric acid; mixing the reaction mixture with the extraction mixture and then feeding water to said extraction zone to keep constant the ratio of components of the extraction mixture and removing from said extraction zone as a heavy phase an extract having the same ratios and ingredients as given for the extraction mixture, and as a light phase C_{10}–C_{30} saturated straight chain aliphatic hydrocarbons containing not more than 0.02 weight percent of water and recycling these hydrocarbons without further treatment to the reaction zone.

3,926,758

PREPARATION OF 1,1,2,3-TETRACHLOROPROPENE FROM 2,3-TRICHLOROPROPANE

Lowell R. Smith, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 212,742, Dec. 27, 1971, Pat. No. 3,823,195. This application Apr. 4, 1974, Ser. No. 457,952

Int. Cl.² E01J *1/10*

U.S. Cl. 204—163 R **6 Claims**

1. A process which comprises feeding a stream consisting essentially of 1,2,3-trichloropropane to a liquid-phase chlorinator, chlorinating the feed stream with chlorine gas in the presence of actinic light so that from about 20 to about 60 percent by weight of the chlorinator effluent remains as unreacted 1,2,3-trichloropropane, passing the chlorinator effluent to a fractionating column, fractionating said chlorinator effluent into a 1,2,3-trichloropropane fraction, a 1,2,2,3-tetrachloropropane fraction, a 1,1,2,3-tetrachloropropane fraction, a 1,1,1,2,3- and 1,1,2,2,3-pentachloropropanes fraction, and a 1,1,2,3,3-pentachloropropane and heavy ends fraction, recycling the 1,2,3-trichloropropane fraction from the fractionating column to the chlorinator, passing the 1,1,2,3-tetrachloropropane fraction from the fractionating column to a caustic dehydrochlorinator, dehydrochlorinating the 1,1,2,3-tetrachloropropane, passing the dehydrochlorinator effluent which comprises mixed trichloropropenes to a second liquid-phase chlorinator, adding chlorine in the presence of actinic light to the carbon/carbon double bond of the trichloropropenes contained in the dehydrochlorinator effluent, passing the second chlorinator effluent which comprises 1,1,1,2,3-pentachloropropane and 1,1,2,2,3-pentachloropropane to a second caustic dehydrochlorinator, passing the 1,1,1,2,3- and 1,1,2,2,3-pentachloropropanes fraction from the fractionating column to the second caustic dehydrochlorinator, dehydrochlorinating the second chlorinator effluent and the 1,1,1,2,3- and 1,1,2,2,3-pentachloropropanes fraction from the fractionating column, passing the second dehydrochlorinator effluent which comprises 1,1,2,3-tetrachloropropene, and 2,3,3,3-tetrachloropropene to an isomerizer packed with clay granules, and isomerizing 2,3,3,3-tetrachloropropene to 1,1,2,3-tetrachloropropene by heating the second dehydrochlorinator effluent in contact with said clay granules to a temperature of from about 150°C. to about 200°C. for from about 0.4 to about 2 hours and removing the isomerizer effluent comprising the product 1,1,2,3-tetrachloropropene.

3,926,759

PROCESS FOR RECOVERING TIN SALTS FROM THE WASTE RINSE WATER OF A HALOGEN TIN PLATING PROCESS

Richard E. Horn, Pittsburgh, and David W. Grenda, Houston, both of Pa., assignors to Pitt Metals and Chemicals, Inc., Pittsburgh, Pa.

Filed Feb. 6, 1975, Ser. No. 547,728

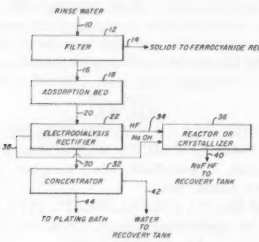
Int. Cl.² C23G *1/32;* **B01D** *13/02*

U.S. Cl. 204—180 P **17 Claims**

1. A process for recovering tin salts from the waste rinse water of a halogen tin plating process comprising,

introducing the rinse water into a depletion compartment of an electrodialytic cell,

introducing an electrolyte solution into an anode compartment and a cathode compartment of said electrodialytic cell, said cathode compartment separated from said depletion compartment by a cationic membrane, said depletion compartment separated from the anode compartment by an anionic membrane,



passing a current through said electrodialytic cell and reducing the mole ratio of fluoride to tin in the rinse water in said depletion compartment, and

thereafter removing a substantial portion of the water from the rinse water solution and forming a concentrated solution having the reduced mole ratio of fluoride to tin.

3,926,760

PROCESS FOR ELECTROPHORETIC DEPOSITION OF POLYMER

James S. Allen, Wilmington, Del., and John D. Craig, Jr., Medford Lakes, N.J., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Sept. 28, 1973, Ser. No. 403,264
Int. Cl.² C25D *13/06, 13/12*
U.S. Cl. 204—181 **24 Claims**

1. In the process of coating, by electrophoretic process, a film-forming polymer on an electrode, wherein the electrode is aluminum or an aluminum alloy, and using in the process, a composition that comprises a continuous phase containing polymer, the improvement comprising:

a. using a polymer that
   1. has a glass transition temperature of at least 25°C.,
   2. is ccapable of being coated onto a suitable substrate by electrophoretic process,
   3. is selected from the group consisting essentially of polymer formed from unsaturated monomers, polyesters, polyurethanes, polyamides polyesterimides, polyamic acids, polyamide-imides, epoxies and mixtures of the foregoing and
   4. has a molecular weight of at least about 100,100,

b. using a continuous phase comprising water and at least one organic liquid, said organic liquid
   1. having a solubility parameter of about 8.5 to 16,
   2. having such solvency that it will at least swell the polymer described in (a), and
   3. being present in an amount of about 1–13 parts by weight organic liquid per part by weight of polymer, and

c. maintaining the electrode that is being coated with a polymer at a temperature at least above that of the continuous phase for a time that is sufficient to produce a polymer film coating the electrode, that after baking at a temperature and for a time that is sufficient to harden the film, has a greater resistivity than a polymer film that is coated under the same conditions with the exception that an elevated temperature is not maintained and whereby the polymer film is substantially free of cracks and blisters caused by evolution of gas at the electrode.

3,926,761

AQUEOUS ELECTROPHORETIC COATING COMPOSITIONS COMPRISED OF POLYCARBOXYLIC ACID BINDER RESIN AND SPARINGLY SOLUBLE ALKALINE EARTH METAL MOLYBDATE

Katsuya Sera, and Akira Kasari, both of Hiratsuka, Japan, assignors to Kansai Paint Company, Limited, Japan

Filed Apr. 4, 1974, Ser. No. 458,045
Claims priority, application Japan, Apr. 9, 1973, 48-40604
Int. Cl.² C25D *13/06*
U.S. Cl. 204—181 **10 Claims**

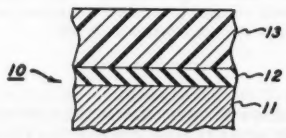
1. An electrophoretic coating composition consisting essentially of an aqueous medium having dispersed therein a polycarboxylic acid binder resin and at least one sparingly water-soluble alkaline earth metal molybdate.

3,926,762

RF SPUTTERING OF TRIGONAL SELENIUM FILMS

Irving S. Goldstein, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 24, 1974, Ser. No. 508,950
Int. Cl.² C23C *15/00;* **H01G** *9/20;* **G03G** *5/04*
U.S. Cl. 204—192 **6 Claims**



1. A method of making a photoconductive imaging device which comprises:

directly depositing a thin layer of trigonal selenium onto a supporting conductive substrate, said deposition comprising RF sputtering said film at an RF input power of up to about 1 to 3 Watts/cm² while maintaining a corresponding elemental selenium flux density up to about 10^{16} atoms/cm²/sec. in an inert atmosphere under vacuum conditions, said deposition being carried out while maintaining the conductive substrate at a temperature in the range of about 70° to 130°C, said substrate being of a material which is electrically blocking with respect to trigonal selenium or is covered with a thin electrically blocking layer to prevent charge injection and which has an adequate number of heterogeneous nucleation centers for trigonal selenium growth but not so many sites so that the process gives rise to a form of trigonal selenium which is too conductive in the dark to be of xerographic utility and such material having a sufficiently high substrate-vapor tension and a sufficiently low substrate-selenium interfacial tension to permit the effective application of the trigonal selenium to its surface by RF sputtering.

3,926,763

METHOD FOR FABRICATING A GAS DISCHARGE PANEL STRUCTURE

Arnold Reisman, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1972, Ser. No. 311,022
Int. Cl.² C23C *15/00;* **B44D** *1/18*
U.S. Cl. 204—192 **8 Claims**

1. A method for fabricating one panel of a gas discharge display structure comprising the steps of:

a. providing a supporting base of glass having a top surface,

b. etching uniform parallel grooves in said top surface,

said grooves having a depth of 0.0001 to 0.0002 inches,

c. filling said grooves with electrically conducting material, and

d. applying a thin uniform planar layer of dielectric material over said top surface to cover said electrically conducting material.

3,926,764

ELECTRODE FOR POTENTIOMETRIC MEASUREMENTS

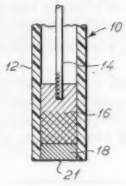
Jaromir Ruzicka, Naerum, and Carl Goran Lamm, Charlottenlund, both of Denmark, assignors to Radiometer A/S, Denmark

Filed May 19, 1972, Ser. No. 255,236

Claims priority, application Denmark, May 19, 1971, 2411/71

Int. Cl. G01n *27/30, 27/46*

U.S. Cl. 204—195 F **10 Claims**



1. An electrode for potentiometric measurements comprising,

A. An electrically conductive body which comprises a mixture of graphite and a thermoplastic polymer hydrophobizing said graphite,

B. A solid electrochemically active ion-sensitive redox system in contact with said hydrophobized graphite,

C. A solid water-soluble compound which is dissociable with liberation of an ionic specie to which the redox system is sensitive, said solid compound being humid and being present in contact with said system, and

D. Means permitting electrolytical communication and limited moisture communication between the solid humid water-soluble compound in the electrode and an exterior sample solution.

3,926,765

ELECTROCHEMICAL ELECTRODE STRUCTURE

Ihsan A. Haddad, Bedford, Mass., assignor to Instrumentation Laboratory, Inc., Lexington, Mass.

Continuation-in-part of Ser. No. 350,774, April 13, 1973, Pat. No. 3,855,100. This application Dec. 20, 1973, Ser. No. 426,513The portion of the term of this patent subsequent to Dec. 17, 1991, has been disclaimed.

Int. Cl.² G01N *27/30*

U.S. Cl. 204—195 F **17 Claims**

1. An electrochemical electrode system including a sensing electrode system that includes a first chamber adapted to contain a sample to be analyzed,

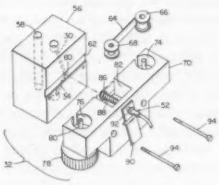
a reference electrode system that includes a second chamber adapted to contain an electrolyte,

and an ionic junction structure including first structure connected to said first chamber, said first structure having an opening therein, second structure connected to said second chamber, said second structure having an opening therein, said openings being in juxtaposed relation, a porous flow control member disposed between said openings, guide structure for establishing a path of straight line motion of one opening defining structure toward the other opening defining structure and alignment of the two openings with said flow control member disposed between said openings for providing a controlled liquid flow path for establishing an ionic junction between the electrolyte and the sample material to be measured by the electrode system, biasing structure for maintaining surfaces of said opening defining structures in juxtaposed clamping relation while not imposing shear force on the said flow control member interposed between said surfaces and lever structure operable to move said one opening defining structure away from said other opening defining structure along said path of straight line motion to release the clamping force imposed by said biasing structure on said flow control member.

9. For use with an electrochemical electrode system including a sensing electrode system that includes a first chamber adapted to contain a sample to be analyzed, and

a reference electrode system that includes a second chamber adapted to contain an electrolyte,

an ionic junction structure including first structure defining a first passage adapted to be connected to said first chamber, said first passage having an orifice therein, second structure defining a second passage adapted to be connected to said second chamber, said second passage having an orifice therein, said orifices being in juxtaposed relation, and an elongated strip having a plurality of porous flow control sections arranged in series along said



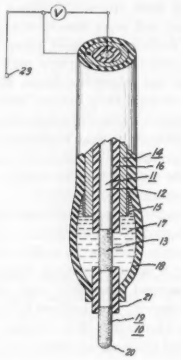
strip, one of said sections being disposed between said orifices to permit restricted flow between said orifices, said strip being movable to remove said one section from between said juxtaposed orifices and concurrently to place another one of said sections between orifices to change the flow control section between said orifices.

17. An electrode system for electrochemical analysis of a sample comprising structure defining a first chamber adapted to contain an electrolyte, structure defining a second chamber adapted to contain the material to be analyzed, each said chamber having opening defining structure in communication therewith, a flow control member carried by one of said opening defining structures and disposed over the opening of said one opening defining structure, guide structure for establishing a path of straight line motion of one of said opening defining structures toward the other of said opening defining structures and alignment of the two said openings with said flow control member disposed between said openings for providing a controlled liquid flow path for establishing an ionic junction between the electrolyte and the sample material to be measured by the electrode system, biasing structure for maintaining surfaces of said opening defining structures in juxtaposed flow control member clamping relation while not imposing shear force on the said flow control member interposed between said surfaces and lever structure operable to move said one opening defining structure away from said other opening defining structure along said path of straight line motion to release the clamping force imposed by said biasing structure on said flow control member.

3,926,766
MINIATURE PROBE CONTAINING MULTIFUNCTIONAL ELECTROCHEMICAL SENSING ELECTRODES

Leonard W. Niedrach, and William H. Stoddard, Jr., both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 1, 1974, Ser. No. 519,795
Int. Cl.² G01N 27/30, 27/46
U.S. Cl. 204—195 P **8 Claims**



1. A miniature probe comprising a carbon dioxide sensor and a pH electrode, the carbon dioxide sensor comprising a flexible, elongated first electrode wire, a first electrochemically active material adhering tightly to and in electrical contact with at least a portion of the first electrode lead wire, the first electrochemically active material responsive to changes in pH, a second electrode lead surrounding at least partially and spaced from the first electrode lead wire, a second electrochemically active region of silver and a silver halide except fluoride on a portion of the second electrode lead, a layer of electrical insulating disposed between the first electrode lead wire and the second electrode lead, an electrolyte contacting both electrochemically active materials, and an outer sheath of carbon dioxide permeable, ion-impermeable diffusion barrier material encapsulating at least the electrochemically active regions and the electrolyte; and a second pH electrode comprising a separate second portion of the first electrode lead wire which is exposed exteriorly of the outer sheath for contact with a sample to be tested for carbon dioxide content and hydrogen ion activity, a third electrochemically active region adhering tightly to and in electrical contact with the exposed portion of the first electrode lead wire, the third electrochemically active material responsive to changes in pH, and the third electrochemically active region insulated electrically from the second electrochemically active region.

3,926,767
ELECTROLYTIC TREATING APPARATUS

Edward C. Brendlinger, Pitcairn; Richard F. Higgs, Monroeville, and Issa J. Kharouf, Pittsburgh, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 21, 1975, Ser. No. 542,757
Int. Cl.² C25F 7/00
U.S. Cl. 204—206 **7 Claims**

1. An apparatus for the electrolytic treatment of metal strip within an electrolyte bath, comprising:

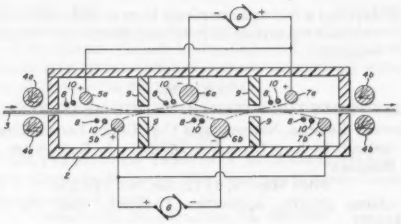
a. means for guiding said strip in a substantially horizontal plane, through said bath,

b. a number, n, of electrode pair configurations, n being at least 2, in which the electrodes forming each of said pairs are,

i. in an electrotreating position, with one electrode of said pair above said substantially horizontal plane and the other electrode of said pair below said substantially horizontal plane,

ii. offset from each other so that the distance between their respective vertical cross-sectional axes is greater than the sum of their cross-sectional widths/2, and

iii. the portion of those electrodes facing the top surface of the strip, exhibits a convex shape with respect to said top surface;



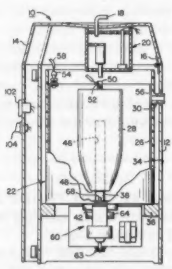
c. a d-c source of EMF, adapted to supply a current density within the range of 500 to 10,000 Amps/ft² to said strip, and connected so as to make the electrodes in each pair approximately the same potential and of a polarity opposite to that of the pair configurations adjacent thereto; and

d. separating each said pair configuration, insulative baffles positioned for the unencumbered passage of said strip, whereby the major portion of the current passing between oppositely charged electrodes is caused to flow through the strip.

3,926,768
SILVER RECOVERY SYSTEM

Kenneth G. Burgess, Derby, N.Y., assignor to Hydrospace Industries, Inc., Buffalo, N.Y.

Filed Apr. 12, 1973, Ser. No. 350,464
Int. Cl.² C25C 7/00
U.S. Cl. 204—229 **18 Claims**



1. An apparatus for recovering silver from spent photographic solutions comprising:

a. an electrolysis vessel having an electrolysis chamber therein;

b. an electrode removably positioned in said vessel adjacent a wall thereof;

c. an electrode of opposite sign positioned at or near the center of said vessel;

d. an impeller located within said vessel adjacent to or near the bottom thereof;

e. means for rotating said impeller;

f. a pre-collecting vessel positioned above the electrolysis chamber and including means for receiving spent photographic solution to be fed into said chamber and siphon

means for dispensing a predetermined volume of said solution into said chamber; and

g. means for passing an electric current between said electrodes and through the solution in said electrolysis chamber for a predetermined period of time in response to the dispensing of said volume of solution from the pre-collecting vessel into the chamber.

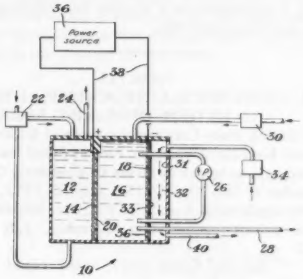
3,926,769
DIAPHRAGM CELL CHLORINE PRODUCTION

Gerhard Gritzner, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 361,744, May 18, 1973. This application Aug. 1, 1974, Ser. No. 493,811

Int. Cl.[2] C25B *9/00*

U.S. Cl. 204—237 **10 Claims**



1. An electrolytic cell to produce chlorine and an alkali metal hydroxide comprising

an anode compartment adapted to contain an anolyte containing an alkali metal chloride;

a cathode compartment adapted to contain a catholyte containing an alkali metal hydroxide, said cathode compartment being spaced apart from said anode compartment by a cation exchange diaphragm;

a cation exchange diaphragm suited to pass alkali metal ions from said anode compartment to said cathode compartment, said diaphragm adapted to separate said anode compartment from said cathode compartment;

an anode positioned in said anode compartment;

a cathode positioned in said cathode compartment and spaced apart from said diaphragm, said cathode having a wall portion adapted to be in contact with the catholyte and another wall portion substantially simultaneously adapted to be in contact with an oxidizing gas;

an oxidizing gas compartment at least partially defined by a surface portion of said cathode and adapted to contain an oxidizing gas;

a means to control the moisture content of the oxidizing gas in combination with an oxidizing gas supply means and said cathode;

a means to circulate the catholyte at least within said cathode compartment in combination with said cathode compartment;

a means to control at least the alkali metal ion concentration of the anolyte;

a means to control the alkali metal hydroxide concentration of the catholyte;

a catholyte head control means adapted to maintain the catholyte upper surface level at least equal to the anolyte upper surface level;

a means to remove the chlorine from said anode compartment;

a means to remove the alkali metal hydroxide from said cathode compartment; and

a means to supply electrical energy to said anode and said cathode.

2. The electrolytic cell of claim **1** wherein said cathode is a foraminous body having at least the surface composed of a substantially inert material selected from the group consisting of Ru, Rh, Pd, Ag, Os, Ir, Pt, Au and Ni with a coating of a mixture of particulate inert metal and an organic component selected from the group consisting of polytetrafluoroethylene and fluorinated copolymers of hexafluoropropylene and tetrafluoropropylene.

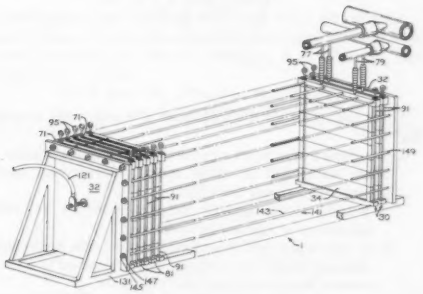
3,926,770
ELECTROLYTIC CELL HAVING SILICON BIPOLAR ELECTRODES

Howard H. Hoekje, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. Nos. 260,790, June 8, 1972, abandoned, and Ser. No. 336,288, Feb. 27, 1973, Pat. No. 3,852,175, and Ser. No. 356,972, May 3, 1973, abandoned, said Ser. No. 336,288, and Ser. No. 356,972, is a continuation-in-part of Ser. No. 260,790, , said Ser. No. 356,972, is a continuation-in-part of Ser. No. 336,288,. This application Dec. 4, 1973, Ser. No. 421,706

Int. Cl.[2] C25B *11/04*

U.S. Cl. 204—256 **56 Claims**



29. A bipolar electrolyzer having a plurality of individual electrolytic cells mechanically and electrically in series, at least one of said cells comprising:

a first silicon cell unit having an anodic surface thereon;

a second silicon cell unit spaced from said first cell unit and having a cathodic surface thereon facing the anodic surface of the first silicon cell unit;

said first cell unit and second cell unit defining an electrolyte chamber therebetween; and

each of said silicon cell units comprising at least **45** weight percent silicon and sufficient dopant to provide an electrical conductivity of at least 100 $(ohm\text{-}centimeters)^{-1}$.

48. The electrolyzer of claim **29** wherein:

a. said first cell unit comprises:

1. peripheral wall spacing means on the vertical sides thereof;
2. gas header means on top of and extending beyond the anodic surface of said first cell unit;
3. liquid header means on the bottom of and extending beyond the anodic surface of said first cell unit; and
4. the leading edges of said peripheral walls, gas header means, and liquid header means are substantially in a first single plane;

b. said second cell unit comprises:

1. peripheral wall spacing means on the vertical sides thereof;
2. gas header means on top of and extending beyond the cathodic surface of said second cell unit;
3. liquid header means on the bottom of and extending beyond the cathodic surface of said second cell unit; and

4. the leading edges of said peripheral walls, gas header means, and liquid header means are substantially in a second single plane; and

c. gasket means are interposed between said first cell unit and said second cell unit.

3,926,771

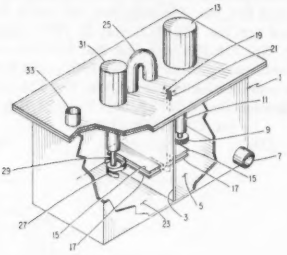
APPARATUS FOR ELECTROSANITIZING WASTE WATER

Donald F. Lieb, Mentor, and Neil W. Stillman, Madison, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 372,085, June 21, 1973, Pat. No. 3,856,642. This application Oct. 3, 1974, Ser. No. 511,764

Int. Cl.² C25B 9/00

U.S. Cl. 204—268 **7 Claims**



1. An apparatus for the treatment of waste water comprising:

a. a primary treatment container adapted for receipt of waste water and an alkali metal chloride and having separately disposed therein,

1. a combination agitator and macerator for any solids suspended in said waste water and

2. an electrode pack containing at least one horizontally disposed anode and cathode and connected to a direct current source external said container;

b. a discrete secondary treatment container having disposed therein an agitator, an electrode pack containing at least one horizontally disposed anode and cathode connected to a direct current source external said container, and an outlet for treated water; and

c. fluid communication means for transferring partially-treated waste water from said primary container to said secondary container.

3,926,772

MAKING AN ANODE ASSEMBLY

Leonard G. Cordone, Allen Park; William A. Donakowski; John R. Morgan, both of Dearborn Heights, and Karl Roeming, Detroit, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 413,154, Nov. 5, 1973, Pat. No. 3,891,534. This application July 1, 1974, Ser. No. 484,727

Int. Cl.² C25D 17/10, 7/04, 3/12

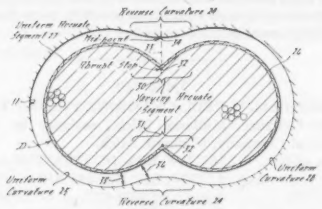
U.S. Cl. 204—283 **4 Claims**

1. A method for fabricating an anode assembly for an electroplating process, comprising:

a. preparing a pair of flat impervious titanium end plates with a continuous groove in each defining an epitrochoid configuration except adjacent the minor axis of said configuration whereat said groove is progressively displaced toward the major axis of the configuration to define a pair of inwardly directed apices,

b. provide a flat flexible perforate wall of titanium sheet metal and assemble said flexible wall with the edges thereof in the grooves of said end plates, the seam of said wall being secured by titanium stitching, and

c. locating a pair of spaced posts between said end walls to maintain a predetermined spacing therebetween independent of said flexible wall and for securing said flexible



wall in said grooves so that any section of said flexible wall is maintained as a straight line between grooves in the opposing end walls.

3,926,773

METAL ANODE FOR ELECTROCHEMICAL PROCESSES AND METHOD OF MAKING SAME

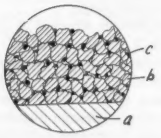
Konrad Koziol; Hans-Carl Rathjen, both of Rothenbach, Pegnitz, and Karl-Heinz Sieberer, Zirndorf near Nuremberg, all of Germany, assignors to Firma C. Conradty, Germany

Continuation of Ser. No. 163,256, July 16, 1971, abandoned. This application Sept. 27, 1973, Ser. No. 401,542

Claims priority, application Germany, July 16, 1970, 2035212

Int. Cl.² C25B 11/02, 11/08, 11/10

U.S. Cl. 204—290 F **10 Claims**



1. In an anode, for electrolytical processes, particularly for chlorine-alkali electrolysis, having a solid core of valve metals selected from the group consisting of titanium, tantalum, niobium, zirconium, hafnium, tungsten, molybdenum, and alloys thereof, and having a covering layer containing activating substances counteracting passivation of the anode, selected from the group consisting of metals and oxides of the platinum metal group, mixed oxides of noble and ignoble metals, and oxides of ignoble metals alone: the improvement in which the activating substances are anchored in a porous covering layer consisting of powdered valve metal which is sintered to the solid valve metal core of the anode.

3,926,774

ELECTRIC TREATER SYSTEM

Frederick D. Watson, and Joseph D. Winslow, Jr., both of Houston, Tex., assignors to Petrolite Corporation

Filed Nov. 13, 1974, Ser. No. 523,289

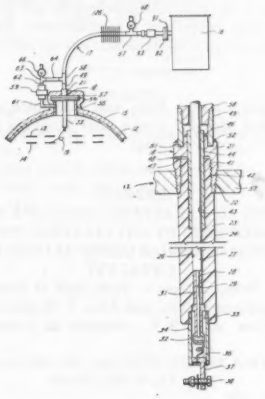
Int. Cl.² C10G 33/02; H01B 17/26

U.S. Cl. 204—308 **20 Claims**

1. A system for electrically treating an oil - continuous emulsion containing dispersed phase contaminating substances comprising:

a. a vessel for containing said emulsion while subjected to resolution forces;

b. electrode means for creating an electric field for promoting emulsion resolution within said vessel;
c. said electrode means including an energizable electrode mounted in electrical isolation from said vessel;
d. a high voltage entrance bushing mounted within a sidewall of said vessel, said entrance bushing having projecting within said vessel an elongated tubular member with an external sidewall surface for immersion within said emulsion, said tubular member being formed of a high electrical resistance plastic material subject to plastic flow upon increase in temperature and pressure, a conductor extending through said tubular member and connected at its vessel interior end to said energizable electrode, said tubular member at its other end being carried in a metal adapter mounted in the sidewall of said vessel for supporting said tubular member in operative position within said vessel, heat sink means associated with said metal adapter for maintaining said tubular member and vessel at substantially the same temperature during operation of said vessel in resolving the emulsion, said metal adapter having an aperture through which said conductor extends to the exterior of said vessel;



e. an external power source with a high-voltage output;
f. a pressure conduit extending in fluid-tight relationship from said metal adapter to said external power sour :e;
g. a high-pressure, high-voltage feedthrough insulator means sealing said pressure conduit at said external power source;
h. an interconnecting high-voltage conductor within a dielectric liquid carried in electrical isolation in said pressure conduit and connecting said conductor in said entrance bushing with said high voltage output of said external power source via said feedthrough insulator means;
i. system means for maintaining the dielectric liquid within said high pressure conduit at substantially the same pressure as the emulsion within said vessel, and said system including a dynamic fluid barrier for preventing intermingling of the emulsion and dielectric liquid; and
j. heat exchanger means associated with the pressure conduit for maintaining said high-pressure, high-voltage feedthrough insulator means at substantially the same temperature at its pressure conduit and power source terminals.

3,926,775

HYDROGENATION OF COAL

Wilburn C. Schroeder, 7316 Radcliffe Drive, College Park, Md. 20740

Filed Nov. 1, 1973, Ser. No. 412,026
Int. Cl.² C10G 1/06
U.S. Cl. 208—10 **11 Claims**

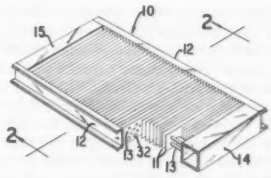
1. A process for hydrogenating coal comprising: continuously circulating a stream of hydrogen-containing gases including CO and steam at coal hydrogenation pressure between about 1000 to 5000 psi through a closed cyclic system including a hydrogenation zone and an oxygen-steam reforming zone, adding coal in the substantial absence of a pasting medium under system pressure to the hydrogenation zone and hydrogenating the coal in said zone at a temperature in the range of about 750°F to 1250°F by contact with said gases to produce liquid and gaseous hydrocarbons in the circulating stream, removing liquid hydrocarbons from the circulating stream without substantially reducing the pressure of such stream, introducing the resulting gaseous stream containing gaseous hydrocarbons and hydrogen into the reforming zone, introducing oxygen and steam at system pressure into said reforming zone for reaction with the gaseous hydrocarbon components of the gaseous stream to produce carbon monoxide and hydrogen and to raise the temperature of the gaseous stream sufficiently to bring the coal to coal hydrogenation temperature in said range, the amount of steam introduced into the reforming zone being in excess of that required for the reforming raction, and introducing the hot gaseous stream from the reforming zone into the hydrogenation zone to complete the closed cycle, heat the coal, and provide steam, carbon monoxide and hydrogen for reaction in the hydrogenation zone.

3,926,776

METHOD AND APPARATUS FOR WAX DEOILING

Roy E. Irwin, 1456 Lakeshore Highway East, Oakville, Ontario, Canada, and Alfred Aufhauser, 8 E. 83rd St., New York, N.Y. 10028

Filed June 28, 1974, Ser. No. 484,217
Int. Cl.² C10G 43/04
U.S. Cl. 208—32 **10 Claims**



1. A method of separating lower melting point components from higher melting point components of a wax composition which comprises confining in the solid state between opposed surfaces a body of wax about 1/16 to about ½ inch in thickness with an upper margin disposed above its lower margin for permitting selective drainage of melted components of said wax composition to drain toward said lower margin, said body of wax being from about 4 to about 24 inches in depth from said upper margin toward said lower margin, gradually raising the temperature of said surfaces through a temperature range during which lower melting point constituents selectively drain from said body of wax leaving residual higher melting point wax in the solid state in the space between said surfaces, recovering the drained lower melting point constituents and thereafter melting and recovering said higher melting point constituents separated from said lower melting point constituents.

3,926,777

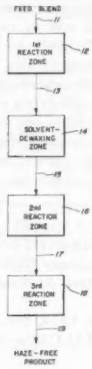
PROCESS FOR PRODUCING A COLORLESS MINERAL OIL HAVING GOOD HAZING PROPERTIES

Roland L. Menzl, Hammond, Ind., assignor to Standard Oil Company, Chicago, Ill.

Filed June 21, 1974, Ser. No. 481,685
Int. Cl.² C10G 23/04
U.S. Cl. 208—57 **19 Claims**

1. A process for producing a colorless mineral oil having good hazing properties from a mineral lubricating oil distillate,

which process comprises contacting said distillate with a first hydrogenation catalyst comprising a metal of Group VIB of the Periodic Table of Elements and a metal of Group VIII of the Periodic Table of Elements deposed on a non-acidic or weakly-acidic support in a first hydrogenation reaction zone under first hydrogenation conditions and in the presence of hydrogen to obtain a first hydrogenated product; subjecting said first hydrogenated product to a solvent-dewaxing treatment to obtain a dewaxed, hydrogenated product; contacting said dewaxed, hydrogenated product with a second hydrogenation catalyst comprising a metal of Group VIB of the Periodic Table of Elements and a metal of Group VIII of the Periodic Table of Elements deposed on a non-acidic or weakly-acidic support in a second hydrogenation reaction zone under second hydrogenation conditions and in the presence of hydrogen to obtain a second hydrogenated product; and contacting said second hydrogenated product with a third hydrogenation catalyst comprising a Group VIII noble metal deposited on a non-acidic or a weakly-acidic support in a third hydrogenation reaction zone under third hydrogenation conditions and in the presence of hydrogen to obtain said colorless mineral oil, said metals of said first hydrogenation catalyst and said metals of said second hydrogenation catalyst being present in the elemental form, as the oxides thereof, as the sulfides thereof, or as mixtures thereof.



3,926,778

METHOD AND SYSTEM FOR CONTROLLING THE ACTIVITY OF A CRYSTALLINE ZEOLITE CRACKING CATALYST

Hartley Owen, Belle Mead, and Edward J. Demmel, Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 19, 1972, Ser. No. 316,632
Int. Cl.[2] C10G *37/02, 11/04;* **B10J** *8/24, 29/12*
U.S. Cl. 208—74 **5 Claims**

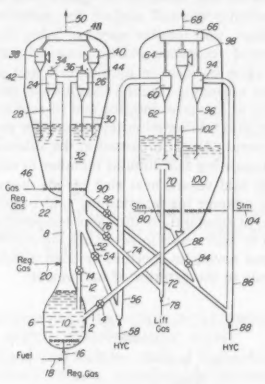
1. A method for converting hydrocarbons by cracking in the presence of a crystalline zeolite containing cracking catalyst which comprises

a. passing a first hydrocarbon feed in admixture with a crystalline zeolite cracking catalyst obtained from a catalyst regeneration zone through a first cracking zone at an elevated cracking temperature in the range of 1000°F. up to about 1300°F. at a hydrocarbon residence time less than about 10 seconds,

b. separating the first hydrocarbon feed catalyst suspension product of the first cracking zone into a hydrocarbon phase and a catalyst phase,

c. combining sufficient hot regeneration catalyst with the separated catalyst phase to provide a mix catalyst temperature of at least 1000°F. and heat soaking said mixed catalyst at said catalyst mix temperature for at least about 5 minutes in the presence of a gas substantially inert to the environment so as to substantially improve the used cracking catalyst component activity,

d. passing catalyst subjected to said heat soaking step through an additional hydrocarbon conversion step maintained at a temperature of at least 1000°F., and



e. separating catalyst from said additional hydrocarbon conversion step for return after stripping thereof to a catalyst regeneration step.

Reforming

3,926,779

UPGRADING OF PARAFFINIC GASOLINE BLENDING COMPONENTS BY CYCLIZATION WITH A PLATINUM/MAGNESIUM OXIDE ALUMINA MATRIX CATALYST

Raymond F. Wilson; Reese A. Peck, both of Fishkill; John H. Estes, Wappingers Falls, and John T. Brandenburg, Hopewell Junction, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Jan. 21, 1974, Ser. No. 435,363
Int. Cl.[2] C10G *39/00*
U.S. Cl. 208—65 **9 Claims**

1. A process for increasing the octane number of a paraffin containing gasoline blending component boiling within the gasoline boiling range and having a paraffin content of from about 70 percent or higher which comprises the steps of (1) cyclizing the paraffins in the blending component by contacting said component under reforming conditions with hydrogen in the presence of a catalyst comprising a noble metal on magnnesium oxide in an alumina gel matrix, to obtain a cyclized blending component, and (2) catalytically reforming said cyclized blending component in the presence of a conventional platinum or platinum bi-metallic reforming catalyst of an alumina or alumina containing support.

3,926,780

HYDROCARBON CONVERSION PROCESS UTILIZING STABILIZED ZEOLITE CATALYSTS

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 191,123, Oct. 20, 1971, abandoned. This application Oct. 15, 1973, Ser. No. 406,679
Int. Cl.[2] C10G *13/02;* **B01J** *8/24, 29/28*
U.S. Cl. 208—111 **11 Claims**

1. In a hydrocarbon conversion process wherein a hydrocarbon feedstock is contacted with a catalyst under hydrocarbon conversion conditions, the improvement which comprises utilizing as said catalyst a particle-form aggregate of a stabilized crystalline aluminosilicate zeolite component and an amorphous refractory inorganic oxide component selected from the class consisting of alumina, silica, magnesia, beryllia,

zirconia, titania, thoria, chromia, and combinations thereof, said catalyst having been prepared by:

a. ion exchanging a crystalline alkali metal aluminosilicate zeolite with ammonium ions under exchange conditions adjusted to reduce the alkali metal content of said zeolite to less than about 3 weight percent determined as the metal and replace between about 20 and 95 percent of the original alkali metal content of said zeolite with ammonium ions;

b. steaming the resultant exchanged zeolite at a temperature of about 800° to about 1650°F in the presence of at least about 0.5 psi water vapor partial pressure for at least about 10 minutes, sufficient to convert said exchanged zeolite to the corresponding hydrogen form and stabilize said zeolite;

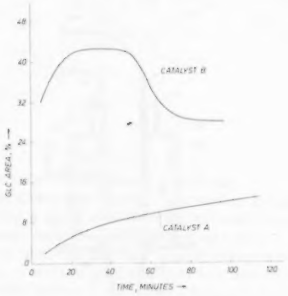
c. re-exchanging the resultant stabilized zeolite with ammonium ions under conditions sufficient to further reduce said alkali metal content to less than about 2 weight percent determined as the corresponding oxide and to introduce into said zeolite by exchange with zeolitic alkali metal ions an amount of ammonium ions corresponding to at least about 5 percent of the original ion exchange capacity of said zeolite; and

d. calcining the re-exchanged zeolite as a particle-form aggregate containing said refractory oxide intimately admixed therein at a temperature of at least about 600°F

3,926,781
CATALYTIC CRACKING OF PARAFFINIC NAPHTHA

Laird H. Gale, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 9, 1973, Ser. No. 404,541
Int. Cl.² C10G *11/08*; B01J *27/12*, *23/08*; C07C *11/02*
U.S. Cl. 208—117 **8 Claims**



1. A catalyst cracking process which comprises contacting a hydrocarbon feedstock containing 40 to 100%v paraffins and boiling substantially in the range C_8-450°C, at cracking conditions, with a catalyst consisting essentially of alumina containing from about 1 to 40% wt. gallia, and recovering a product having a major portion of hydrocarbons boiling below the boiling range of the feedstock and containing substantial amounts of normally gaseous olefins and gasoline boiling range aromatics.

3,926,782
HYDROCARBON CONVERSION

Charles J. Plank, Woodbury; Edward J. Rosinski, Almonesson, both of N.J., and Albert B. Schwartz, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

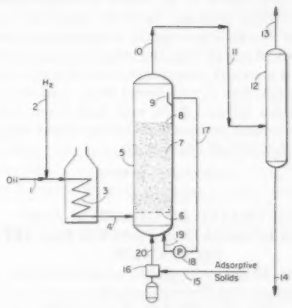
Filed Feb. 9, 1973, Ser. No. 330,925
Int. Cl.² C10G *35/06*, *13/02*; C07C *3/50*
U.S. Cl. 208—135 **12 Claims**

1. A process for hydrocarbon conversion which comprises contacting a hydrocarbon charge under conversion conditions with a catalyst comprising a ZSM-5 type crystalline zeolite characterized by an ultimate crystallite diameter of 0.005 to 0.1 micron as crystallized.

3,926,783
EBULLATED BED PROCESS

Ronald H. Wolk, Trenton, N.J., assignor to Hydrocarbon Research, Inc., Morristown, N.J.

Continuation-in-part of Ser. No. 245,469, April 19, 1972, abandoned. This application Mar. 13, 1974, Ser. No. 450,804
Int. Cl.² C10G *23/10*
U.S. Cl. 208—157 **1 Claim**



1. A process for avoiding the loss of fluidization of an ebullated catalyst bed resulting from the formation of two mutually insoluble liquid phases during the catalytic hydroconversion of heavy asphaltene containing residual oils wherein the catalyst is of a size between 60 mesh and one-half inch diameter and the hydroconversion is carried out in a reaction zone at temperatures between 700° and 900°F, at pressures between 500 and 3000 psig with a space velocity of the residual oil between 0.2 and 2.0 volumes of feed per hour per volume of reaction zone and wherein one of the liquid phases has the heaviest and largest molecules and is insoluble in the other liquid phase, said liquid phase having the heaviest and largest molecules being a minor portion of the total liquid in the reaction zone:

a. adding a second particulate solid which is alumina to said ebullated bed at a rate to absorb the liquid phase that defluidizes the catalyst wherein said second particulate solid has a diameter of less than 10 percent of the diameter of said catalyst and has more than 0.2 cc/gram of its pore volume in pores with diameters of at least 10,000 angstroms; and

b. passing said second solid upwardly through said catalyst and out of said bed with the liquid phase that would defluidize the ebullated catalyst bed.

3,926,784
PLURAL STAGE RESIDUE HYDRODESULFURIZATION PROCESS WITH HYDROGEN SULFIDE ADDITION AND REMOVAL

Robert D. Christman, Pittsburgh, and Stephen J. Yanik, Gibsonia, both of Pa., assignors to Gulf Research & Development Co., Pittsburgh, Pa.

Filed Aug. 22, 1973, Ser. No. 390,361
Int. Cl.² C10G *34/00*
U.S. Cl. 208—210 **3 Claims**

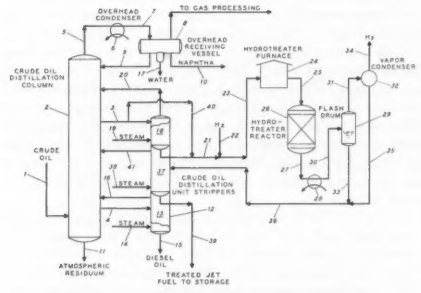
1. A process for hydrodesulfurizing a feed residual petroleum oil containing asphaltenes, metals and sulfur without a distillation or a solvent extraction step for removal of asphaltenes comprising passing said feed oil through a plurality of hydrodesulfurization stages in series including an initial stage and a final stage each operating at a temperature between about 650° and 800°F., each stage employing a catalyst com-

prising Group VI and Group VIII metals on alumina, increasing the temperature in each stage with increasing catalyst age to compensate for catalyst activity aging loss, maintaining a lower hydrogen pressure in said final stage than in said initial stage, removing asphaltenes, mteals and sulfur from the feed oil in said initial and final stages with a greater amount of metals and sulfur being removed from the feed oil in said initial stage than in said final stage, operating said final stage at a hydrogen pressure between 1,300 and 1,900 psi and operating said initial stage at a hydrogen pressure up to 2,300 psi which is higher than the pressure in said final stage so that the ratiq of percent demetallization to percent desulfurization is higher in the final stage than in the initial stage, including gaseous hydrogen sulfide or an added hydrogen sulfide precursor in the stream entering the final stage, the catalyst in said final stage comprising a higher weight percent of Group VI and Group VIII metals than the catalyst in said initial stage so that there is a greater percentage reduction in asphaltenes in said final stage than in said initial stage, and recovering a hydrodesulfurized effluent from said final stage comprising more than 80 volume percent yield boiling above the gasoline range based on said feed residual oil.

3,926,785
INTEGRATED DISTILLATION AND HYDRODESULFURIZATION PROCESS FOR JET FUEL PRODUCTION

Jack W. Siegel, El Segundo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 194,440, Nov. 1, 1971, abandoned.
This application Feb. 11, 1974, Ser. No. 441,074
Int. Cl.² C10C *23/00*
U.S. Cl. 208—211 **3 Claims**



1. An integrated crude oil distillation and oil hydro-desulfurizing process for jet fuel production which comprises:

a. withdrawing a stripped side cut fraction having a boiling range between 300°F. and 700°F. from a first stripper in a crude distillation unit at a temperature above 300°F., said unit including a crude oil distillation column having an associated overhead system, said system comprising an overhead condenser and an overhead receiving vessel,

b. feeding the withdrawn fraction from said first stripper to a hydrodesulfurizing reactor before cooling said fraction below 250°F.,

c. hydrodesulfurizing said fraction in said hydrodesulfurizer reactor by contacting the fraction with a hydrodesulfurizing catalyst and hydrogen at a temperature between 600° and 900°F. and a pressure between 400 and 5,000 psig and withdrawing a hydrodesulfurized reaction effuent from the reactor, said contacting being sufficient to sweeten the jet fuel fraction by removing mercaptans,

d. passing the hydrodesulfurized liquid phase separated from step (c) to a second stripper in the crude distillation unit before cooling said liquid phase below 400°F.,

e. stripping H_2, H_2S and light hydrocarbons from said liquid phase in said second stripper, said light hydrocarbons boiling below the lower cut point of said side cut fraction,

f. passing a stream comprising said H_2, H_2S and light hydrocarbons from said second stripper to an upper portion of said distillation column, and separating normally liquid hydrocarbon components in said stream from said overhead receiving vessel, and

g. withdrawing from said second stripper said hydrodesulfurized jet fuel poroduct.

3,926,786
PRODUCTION OF LUBRICATING OILS

Richard L. Coleman, Port Arthur; Billy H. Cummins, and William B. Ashton, both of Nederland, all of Tex., assignors to Texaco Inc., New York, N.Y.

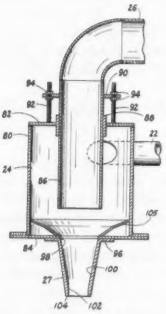
Continuation of Ser. No. 308,068, Nov. 20, 1972, abandoned.
This application Dec. 21, 1973, Ser. No. 427,155
Int. Cl.² C10G *23/02*
U.S. Cl. 208—264 **5 Claims**

1. A process for improving the viscosity index of a lubricating oil stock which comprises contacting said lubricating oil stock in the presence of hydrogen under hydrotreating conditions with a catalyst comprising from 1 to 8 wt. % cobalt as the oxide and from 7 to 20 wt. % molybdenum as the oxide on a support comprising alumina, said catalyst containing from about 5 to 30 wt. % mordenite in hydrogen form and also containing from 0.1 to 5 wt. % halogen.

3,926,787
METHOD AND APPARATUS FOR REDUCING SULPHUR AND ASH CONTENT OF COAL

Larry T. Gay, Frostburg, Md., assignor to C-G Process Coal Company, Tulsa, Okla.

Filed Mar. 2, 1973, Ser. No. 337,590
Int. Cl.² B04C *9/00*
U.S. Cl. 209—3 **8 Claims**



1. A method of separating a salable coal product from a solid material containing coal therein comprising the steps of introducing a pre-crushed and pre-screened quantity of said solid material of particle size 1¼ × 0 inch into a mixing zone located centrally within a mixing chamber, said mixing zone being open at the top and the bottom and communicating at said bottom with said mixing chamber, introducing a first stream of water downwardly and centrally into said mixing zone at about 65 p.s.i. to create a condition of turbulence within said zone and within said mixing chamber, introducing a second stream of water into said mixing chamber at about 2 to 5 p.s.i. under substantially quiescent conditions and adjacent the bottom of said mixing chamber, withdrawing a stream of a solids-water mixture from the bottom of said mixing chamber, introducing said solids-water mixture tangentially into a cyclone separator at about 4 to 6 p.s.i., said cyclone separator having inner and outer vortex established by the tangential introduction of said solids-water mixture passing the tangentially moving solids-water mixture downwardly

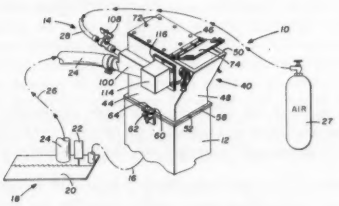
from the outer vortex into contact with a first conical member located above the bottom of said cyclone separator and adjacent the outer surface thereof, said first conical member having a cone angle of generation approximately equal to 68°, passing the tangentially moving solids-water mixture further downwardly into contact with a second conical member extending from said first conical member to the bottom of said cyclone separator and having a cone angle of generation approximately equal to 53°, passing the tangentially moving solids-water mixture still further downwardly into contact with a third conical member located below said bottom of said cyclone separator and having an upper opening of substantially the same size and mating with an opening provided at the bottom of said second conical member, said third conical member having a cone angle of generation approximately equal to 7°, withdrawing a solids-water mixture from the top of said inner vortex and treating the mixture to remove water therefrom and to recover a solid coal product, withdrawing a solids-water mixture from the bottom of said cyclone separator below said third conical member and treating the mixture to remove water therefrom and to obtain a refuse, and recycling the water removed from said mixtures.

3,926,788

FLUX RECOVERY UNIT

Galen H. Stephens, 108 J.J. Lemon, Hutchins, Tex. 75141, and Charles L. Revill, 1102 Falcon, Irving, Tex. 75060

Filed May 31, 1974, Ser. No. 474,917
Int. Cl.² B07B *13/16*
U.S. Cl. 209—3 **15 Claims**



2. A flux recovery apparatus comprising:

a housing defining a chamber and having an inlet port for receiving a mixture of flux and gas and having separate discharge ports for said flux and said gas;

means for directing the flow of said mixture through said inlet port and into said chamber in a first direction;

a first baffle means in the path of flow of said mixture and transverse to the direction of flow; and

a second baffle means at a right angle to said first baffle means transverse to the direction of flow of said mixture.

3,926,789

MAGNETIC SEPARATION OF PARTICULAR MIXTURES

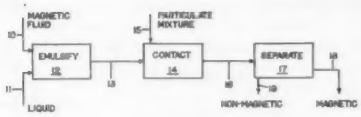
Roland H. Shubert, Reston, Va., assignor to Maryland Patent Development Co., Inc., Silver Spring, Md.

Filed July 5, 1973, Ser. No. 376,335
Int. Cl.² B03O *1/00*
U.S. Cl. 209—8 **26 Claims**

1. A method of recovering a mineral from the gangue constituents of its ore which comprises:

comminuting the ore to a size range whereat there is achieved substantial physical liberation of the mineral from the gangue constituents of the ore;

rendering the surfaces of the mineral particles magnetic by selectively wetting the surfaces of said mineral particles with a magnetic fluid, said magnetic fluid comprising an ultra-stable colloidal suspension of magnetic particles in a liquid carrier, said liquid carrier being selected from the group consisting of hydrocarbons, fluorocarbons, silicone oils, water and esters, said magnetic fluid being capable of reacting with an external magnetic field and displaying the behavior of a homogeneous Newtonian liquid, and



subjecting the comminuted ore to a magnetic separation whereby a magnetic concentrate comprising magnetic fluid-wetted mineral particles is recovered.

3,926,790

FLOTATION METHOD FOR SEPARATION OF MIXTURE OF PLASTICS

Sumio Izumi, Kokubunji, Japan, assignor to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1974, Ser. No. 443,937
Claims priority, application Japan, Feb. 19, 1973, 48-19308
Int. Cl.² B03B *1/04*; B03D *1/02*
U.S. Cl. 209—9 **15 Claims**

1. A method for the separation of a particulate mixture of plastics comprising a polyacrylate and polyvinyl chloride into each of said plastics which comprises conditioning said plastic mixture in an aqueous liquid medium using an alkali metal or alkaline earth metal salt of lignin sulfonic acid as a conditioning agent to render the surfaces of said polyvinyl chloride more hydrophilic than said polyacrylate and subjecting the resulting mixture to a froth flotation, in the presence of a frothing agent,, and simultaneously separating the polyvinyl chloride together with said aqueous liquid medium, said polyacrylate being recovered as a float and said polyvinyl chloride being recovered as a tailing.

3,926,791

FLOTATION METHOD OF SEPARATION OF MIXTURE OF PLASTICS

Sumio Izumi, and Hiroshi Tanaka, both of Tokyo, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

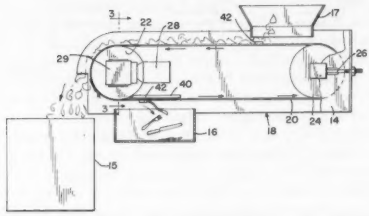
Filed Feb. 19, 1974, Ser. No. 443,574
Claims priority, application Japan, May 22, 1973, 48-57012
Int. Cl.² B03D *1/02, 1/00*
U.S. Cl. 209—9 **16 Claims**

1. A method for the separation of a particulate mixture of plastics comprising a polyacrylate and polyvinyl chloride into each of said plastics which comprises conditioning said mixture of plastics in an aqueous liquid medium using at least one hydrophilic organic colloid as a conditioning agent to render the surfaces of said polyvinyl chloride more hydrophilic than said polyacrylate and subjecting the resulting mixture to a froth flotation in the presence of a frothing agent, to float the polyacrylate and simultaneously separate the polyvinyl chloride together with said aqueous liquid medium, said polyacrylate being recovered as a float and sad polyvinyl chloride being recovered as a tailing.

3,926,792
APPARATUS AND METHOD FOR AUTOMATICALLY SEPARATING MAGNETIC FROM NON-MAGNETIC SUBSTANCES

J. Philip Buford, Park Ridge, Ill., assignor to Recon Corporation, Park Ridge, Ill.

Filed Aug. 23, 1973, Ser. No. 390,958
Int. Cl.[2] B03C *1/16*
U.S. Cl. 209—215 20 Claims



20. A method of automatically separating magnetically attracted, reusable tableware and the like, from non-magnetic food and paper waste in a quick and efficient manner including the steps of:

placing the unseparated tableware and food and paper waste on a conveyor means;

establishing a magnetic field by magnet means positioned adjacent said conveyor means to radiate said magnetic field generally transversely to the surface of said conveyor means;

moving said conveyor means and said unseparated tableware and waste carried thereon into said magnetic field such that said tableware is positively attracted toward said magnet means and thereby magnetically separated from said non-magnetic substances;

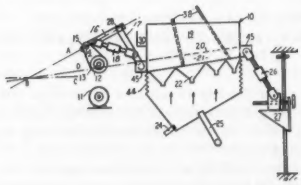
extending said magnetic field by magnetically induced means in order to transport said tableware beyond the point to which it would be transported by the effects of said magnet means alone; and

automatically shunting the extended magnetic field through keeper means periodically brought adjacent said induced means, such that said tableware is thereby positively released at a desired point.

3,926,793
MINERAL SEPARATION APPARATUS

James Charles Wise, 25 Third Ave., Epping West, New South Wales 2121, Australia

Filed Apr. 11, 1973, Ser. No. 350,241
Claims priority, application Australia, Apr. 12, 1972, 8578/72
Int. Cl.[2] B03B *5/12*
U.S. Cl. 209—426 10 Claims

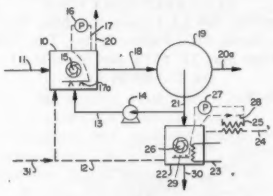


1. A mineral separating apparatus comprising a housing containing therein a substantially elongated planar porous means, said porous means being inclined relative to the horizontal and vertical planes such that there is an upper and lower lateral and longitudinal side, means for adjustably controlling the said incline of the said porous means, oscillating means to oscillate said porous means in a direction parallel to the lateral side, a power means connected to said oscillating means whereupon initiation of said power means said porous means oscillates in a substantially sinusoidal or arcuate path, said porous means being further immersed in a body of liquid such that by the action of the oscillations and said body of liquid mineral feed which is introduced onto said porous means travels upwardly on the porous means in a direction substantially parallel to the lateral side whereby the coarsest highest density particles of the feed are arranged substantially along the upper longitudinal side whilst the fine least dense particles are arranged along the lower longitudinal side, and whereby the material product travels downwardly in a direction substantially transverse to the direction of oscillation to discharge at a product outlet.

3,926,794
WARM SLUDGE DIGESTION WITH OXYGEN

Nathan P. Vahldieck, Snyder, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 28, 1974, Ser. No. 484,255
Int. Cl.[2] C02C *1/06*
U.S. Cl. 210—5 10 Claims



1. In a method for BOD-removal from wastewater in a covered aeration zone and activated sludge in a covered digestion zone by aeration with oxygen gas, the improvement comprising:

a. introducing first gas comprising at least 40% oxygen (by volume) and mixing same as the aeration gas with the wastewater and recycled sludge in said covered aeration zone to form mixed liquor and simultaneously continuously recirculating one of such fluids against the other fluids in the aeration zone in sufficient quantity and rate to maintain the dissolved oxygen content (DO) of the mixed liquor at least at 0.5 mg/l, with the mixed liquor temperature at least 15°C, separating the mixed liquor into purified liquid and activated sludge, and discharging unconsumed oxygen-containing gas from the aeration zone at rate such that its oxygen content is not more than 40% of the total oxygen introduced to the digestion zone;

b. returning at least about 85% by weight of the activated sludge to the aeration zone as said recycled sludge;

c. providing second gas comprising at least 80% oxygen (by volume) and including part of said first gas;

d. introducing said second gas and the unreturned activated sludge from step (b) to the digestion zone, mixing same and simultaneously recirculating one of such fluids against the other fluids in the digestion zone in sufficient quantity and rate to maintain the dissolved oxygen content of sludge at least at 2 mg/l and the total suspended solids content (MLSS) of the sludge at least at 15,000 mg/l.

e. maintaining the sludge in the digestion zone during step (d) at temperature of at least 25°C and also at least 10°C warmer than the mixed liquor temperature in step (a) but below 75°C;

f. continuing step (e) for sufficient solids retention time (duration) to oxidize at least 60% of the biodegradable volatile suspended solids content of the sludge introduced to the digestion zone, and thereafter separately discharg-

ing stabilized sludge residue and oxygen-partially depleted digestion gas of at least 40% oxygen purity at rate such at its oxygen content is at least 35% of the oxygen content of said second gas entering the digestion zone; and

g. providing said oxygen-partially depleted digestion gas from step (g) as at least the major part of said first gas introduced step (a).

3,926,795

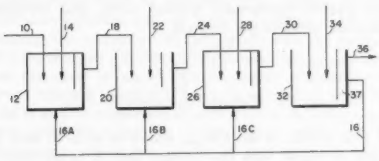
BIOLOGICAL TREATMENT OF PLANT WASTE STREAMS TO REMOVE CYANURIC ACID

Jerome Saldick, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed May 23, 1974, Ser. No. 472,836

Int. Cl. C02c *5/10*

U.S. Cl. 210—11 **2 Claims**



1. The method of rapidly decomposing cyanuric acid contained in an aqueous mixture which comprises holding the aqueous mixture at a pH of about 5.0 to 8.5 in contact with an active biomass containing bacteria derived from natural water, sewage or soil, at least a portion of which biomass is under anaerobic conditions, for a time sufficient to hydrolyze the cyanuric acid to CO_2 and ammonia, maintaining enough nutrient in the mass to feed the bacteria, while maintaining the mass at a temperature above freezing and below 50°C.

3,926,796

PREPARATION OF ACTIVATED SLUDGE AND TREATMENT OF WASTE WATER THEREWITH

Yukio Fujita, Yamadanishi; Iwao Kawasaki, Kurashiki, and Hideo Nishikawa, Toyonaka, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 23, 1974, Ser. No. 508,142

Claims priority, application Japan, Sept. 25, 1973, 48-108182

Int. Cl.² C02C *1/06*

U.S. Cl. 210—11 **5 Claims**

1. A process for the preparation of an activated sludge capable of assimilating a solution of polyvinyl alcohol resins which comprises subjecting an ordinary activated sludge to acclimation under conditions of 15° to 35°C. in temperature, 7.0 to 8.5 in pH and 1 to 6 p.p.m. in dissolved oxygen for 5 to 15 hours with agitation in a prepared by dissolving at least one member selected from the group consisting of polyvinyl alcohol having not less than 70% by mole of a degree of hydrolysis, water-soluble acetalizated polyvinyl alcohol, water-soluble urethanated polyvinyl alcohol, water-soluble hydrolyzed copolymer of vinyl acetate and ethylene or propylene water-soluble hydrolyzed copolymer of vinyl acetate and maleic acid, crotonic acid, acrylic acid or acrylic amide, partially acetalizated one of the above hydrolyzed copolymers and urethanated one of the above hydrolyzed copolymers in an amount of 0.005 to 0.6 kg./kg. mixed liquor suspended solid/day and at least one solution selected from the group consisting of acetic acid, propionic acid, potassium, sodium, calcium or ammonium salts thereof, methyl, ethyl, propyl or butyl esters thereof, amides thereof, malic acid, citric acid, fumaric acid, oxalic acid and lactic acid, in the range of biochemical oxygen demand loading of 0.05 to 0.3 kg./kg. mixed liquor suspended solid/day.

3,926,797

SEPARATION APPARATUS USING ULTRAFILTRATION

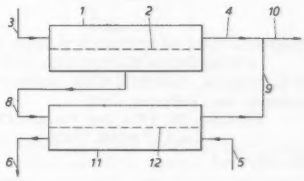
Claude Gigou, Vernaison, and Jean-Pierre Quentin, Lyon, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed Mar. 15, 1972, Ser. No. 234,941

Claims priority, application France, Mar. 17, 1971, 71.09359

Int. Cl.² B01D *31/00, 13/00*

U.S. Cl. 210—22 **9 Claims**



1. Apparatus for the purification of a liquid, which comprises:

a. an ultrafiltration cell and an ultrafiltration membrane, dividing said cell into two compartments, an inlet and an outlet for said first compartment for the liquid to be treated and an outlet for the ultrafiltered liquid for said second compartment;

b. means for establishing in the first compartment of said ultrafiltration cell a pressure higher than that prevailing in the second compartment of the cell; and

c. a dialyser and an ionic membrane separating said dialyser into two compartments, an inlet for said first compartment connected to the outlet from the second compartment of the ultrafiltration cell and an outlet for said first compartment connected to the outlet of the first compartment of the ultrafiltration cell, the second compartment of said dialyser being itself equipped with an inlet and an outlet, said ionic membrane having a selective permeability greater than 50% and a urea/NaCl selectivity greater than 5.

3,926,798

REVERSE OSMOSIS MEMBRANE

John E. Cadotte, St. Paul, Minn., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 17, 1974, Ser. No. 515,725

Int. Cl.² B01D *31/00, 13/00*

U.S. Cl. 210—23 **6 Claims**

1. A process for preparation of a composite reverse osmosis membrane comprising:

coating a microporous support with an aqueous solution of furfuryl alcohol and an acid catalyst capable of polymerizing the furfuryl alcohol;

heating to polymerize the furfuryl alcohol; and

curing at a temperature of about 110° to 160°C for a period of about 1 to 30 minutes.

3,926,799
SUPPORT FOR DYNAMIC MEMBRANE

David G. Thomas; William R. Mixon, and Phil H. Hayes, all of Oak Ridge, Tenn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

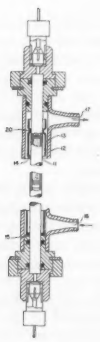
Continuation of Ser. No. 383,234, Oct. 3, 1972, abandoned. This application Sept. 24, 1974, Ser. No. 508,782
Int. Cl.[2] B01D *31/00, 13/00*
U.S. Cl. 210—23 6 Claims

1. A method for preparation of a composite support for a dynamic hyperfiltration membrane comprising coating a porous substrate with an essentially uniform layer of zirconium oxide by applying to the substrate a layer of an aqueous slurry of zirconium oxide, the particle size of the zirconium oxide being about 1.5 to 30 microns and the concentration of the zirconium oxide in the slurry being about 30 to 60 weight percent; drying at room temperature; and firing at a temperature of 900° to 1400°C to form a durable layer of zirconium oxide on the substrate.

3,926,800
TEMPERATURE STABILIZED WATER JACKET CHROMATOGRAPHIC COLUMN

Donald E. Stephens, Palo Alto, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 25, 1974, Ser. No. 436,437
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—31 C 8 Claims



1. In an analysis system having an analytical chromatography column, the improvement which comprises, in conjunction with means for avoiding fluctuations of column temperature which have long time cycles:

spaced tubes which include an inner tube surrounding the column but spaced therefrom with a relatively high thermal capacity medium between the column and the inner tube,.

a water jacket constituting the means for avoiding temperature fluctuations which have long time cycles, and located around the column encompassed by the tube, whereby water from the water jacket is maintained between the column and the tubes to form the relative high thermal capacity medium, and

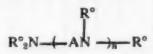
means for limiting flow of water between the column and the inner tube to retain a relatively high thermal capacity medium between the column and the inner tube to supplement the thermal capacity of the column and minimize temperature-induced variations in volume of the column, and thus minimizing temperature-induced variation in rate of flow from the column.

3,926,801
METHYLENE PHOSPHONATES OF GLYCIDYL REACTED POLYALKYLENE POLYAMINES AND USE IN SCALE AND CHELATION

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 129,955, March 31, 1971, Pat. No. 3,799,893. This application Dec. 11, 1973, Ser. No. 423,671
Int. Cl.[2] C02B *5/06*
U.S. Cl. 210—58 8 Claims

1. A process for inhibiting scale formation in aqueous systems by chelation or sequestration which comprises adding to said system a methylene phosphonate of glycidyl compound reacted polyalkylene polyamine, said methylene phosphonate of glycidyl compound reacted polyalkylene polyamine having nitrogen-bonded methylene phosphonate units and nitrogen-bonded glycidyl compound reacted units, said methylene phosphonate being of the formula



where n is 1–100, A is $(CX_2)_m$ where m is 2–10 and X is hydrogen or alkyl, with the proviso that A is the same or different when n is 2 or more, and R^o is a methylene phosphonate unit, glycidyl compound reacted unit or hydrogen.

3,926,802
METHOD FOR REMOVING BOTH ORGANIC MATTER AND BACTERIA FROM A BODY OF WATER

Joel Hedgpeth, Clovis, Calif., assignor to Water Science Inc., Calif.

Filed May 28, 1974, Ser. No. 473,577
Int. Cl.[2] C02B *1/36*
U.S. Cl. 210—62 1 Claim

1. In a method of treating a body of water substantially confined in a swimming pool with iodine, the improvement comprising the steps of:

introducing into a selected body of water substantially confined in a swimming pool, upstream of the filter medium for a filtration system provided for the pool, a suitable quantity of a mixture of complexes including substantially equal parts by weight of cuprous iodide and copper carbonate for establishing in the body of water a concentration of copper ions above 0.015 parts per million but less than 2.0 parts per million copper ions and adding to the body of water a sufficient quantity of an oxidant selected from a class of oxidants, including chlorine, for causing elemental iodine to be released from the cuprous iodide in quantities sufficient for maintaining in solution in said body a concentration of free iodine above 0.1 parts per million but less than 5.0 parts per million, whereby free iodine is slowly released from the cuprous iodide in the presence of chlorine unattended by discoloration of the water for thus rendering the body of water safe and pleasing in appearance.

3,926,803
CYANIDE ENHANCEMENT OF THE PHOTOOXIDATION OF ACETIC ACID

Craig B. Murchison, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 6, 1975, Ser. No. 538,696
Int. Cl.[2] C02B *3/08*
U.S. Cl. 210—63 6 Claims

1. In a method of oxidizing carboxylic acids present in an aqueous solution of pH 4 or less by exposure to light waves ranging in length from about 2000 A to 5800 A in the pres-

ence of oxygen and a catalytic quantity of from about 1 to about 15 parts per million of ferric ions, whereby carbon dioxide is released and the total organic carbon of the solution is thereby reduced, the improvement which comprises: further catalyzing said oxidation by introducing into said solution a quantity of cyanide ions sufficient to provide, in said solution, a mole ratio of cyanide ions to ferric ions of at least about 5 to 1.

3,926,804
FLUID FILTRATION AND SAMPLING

Charles Laird McClure, Malvern, Pa., assignor to Pro-Tech Inc., Malvern, Pa.

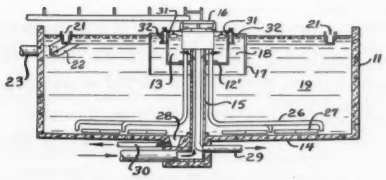
Division of Ser. No. 262,221, June 13, 1972, Pat. No. 3,840,123. This application Oct. 7, 1974, Ser. No. 512,515
Int. Cl.² B01D *33/06*
U.S. Cl. 210—76 **6 Claims**

1. Liquid sampling comprising withdrawing liquid from a body thereof, filtering the withdrawn liquid through cylindrical foraminous means by establishing therewithin at least one influx compartment and at least one efflux compartment, admitting the withdrawn liquid radially into the influx compartment through a portion of the foraminous means intermediate the body of liquid and the influx compartment and thereby filtering the admitted liquid, exhausting such filtered liquid in an axis-paralleling direction from the influx compartment, collecting a sample of the filtered withdrawn liquid, recirculating withdrawn liquid in the opposite direction through the foraminous means by admitting into the efflux compartment in an axis-paralleling direction withdrawn filtered liquid not so collected, exhausting such liquid radially from the efflux compartment through a portion of the foraminous means intermediate the efflux compartment and the body of liquid, and interchanging the respective compartments and their contiguous portions of the foraminous means and thereby backflushing such means.

3,926,805
DISTRIBUTION INLET SYSTEM WITH AUTOMATIC TANGENTIAL-GATE ADJUSTMENT

James Donald Walker, Aurora, Ill., assignor to Peabody Galion Corporation, New York, N.Y.

Filed Mar. 9, 1973, Ser. No. 339,900
Int. Cl.² B01D *21/24*
U.S. Cl. 210—101 **12 Claims**

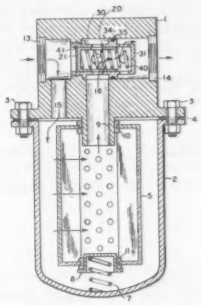


1. A distribution inlet system for a flocculation chamber and the like and which may be used with varying rates of liquid inflow into the inlet system, including an entry chamber provided with means for supplying the inflow liquid to be distributed, and connected to a flocculation chamber through a plurality of ports controlled by angularly disposed adjustable gates for constricting the flow area for flow through the ports and past the gates to ensure an effective velocity and for deflecting the flow to set up an over-all rolling action in the flocculation chamber; and automatic means for adjusting the gates to increase the flow area and decrease the angularity of deflection with increased inflow into the entry chamber.

3,926,806
NO-BYPASS FILTER SYSTEM

Ronald M. Gaudet, Cheshire, Conn.; Samuel S. Michell, Monroeville, and Michael J. Kozy, Pittsburgh, both of Pa., assignors to Schroeder Brothers Corporation, McKees Rocks, Pa.

Filed June 10, 1974, Ser. No. 477,982
Int. Cl.² B01D *33/40*
U.S. Cl. 210—137 **4 Claims**



1. In a filter system for a fluid activated system comprising a filter head, canister and filter element, said filter element arranged to divide the canister into an inlet and outlet side, said filter head having an inlet port for directing fluid to the inlet side of said canister and an outlet port for delivering fluid from the outlet side of the said canister, the improvement comprising a means for maintaining the pressure drop across the filter element constant comprising a piston cylinder having an open and closed end, a hollow cylindrical piston positioned in said piston cylinder having a closed end disposed generally at the open end of the cylinder and an open end disposed generally at the closed end of the cylinder, means for biasing the closed end of the hollow piston away from the closed end of the cylinder, openings being provided in the sidewall of the cylinder and the hollow piston for permitting flow into the piston and cylinder and openings being provided in the sidewall of the piston near the closed end for permitting flow out of the cylinder, said piston and cylinder arranged such that the outside of the closed end of the piston cylinder is in communication with the inlet port and the piston and cylinder form part of the flow path between the outlet side of the filter element and the outlet port such that as the filter collects contaminants the pressure at the inlet port increases and the pressure drop across the filter element also increases until the cylindrical piston moves within the piston cylinder to restrict the flow of fluid from the outlet side of the filter element to the outlet port, thus preventing further pressure drop across the filter element.

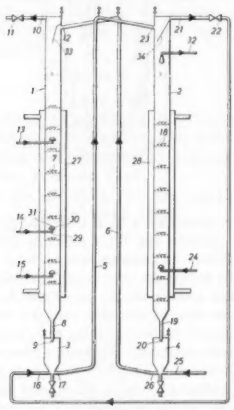
3,926,807
DEVICE FOR THE CONTINUOUS TREATMENT OF LIQUID STREAMS

Heinz Evers, Linkenheim, and Werner Knoch, Walzbachtal, both of Germany, assignors to Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen m.b.H., Leopoldshafen, Germany

Filed June 22, 1973, Ser. No. 372,583
Claims priority, application Germany, June 23, 1972, 2230714
Int. Cl. B01d *35/18*
U.S. Cl. 210—177 **23 Claims**

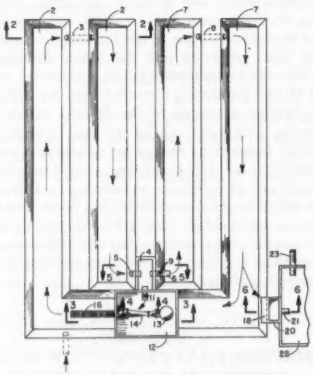
1. A device for the continuous treatment of a liquid stream with solids that are continuously circulated from top to bottom in a treatment column in countercurrent flow to the liquid stream comprising:

a. a treatment column having:
1. at least one plate;
2. a heating and cooling jacket;
3. means for finely dispersed feeding of a solution into the upper part of the treatment column for conditioning the solids carried from top to bottom in the treatment column prior to the contact of the solids with the liquid stream to be treated;
4. means for finely dispersed feeding of the liquid to be treated to the central part of the treatment column;
5. means for finely dispersed feeding of a washing solution to the bottom of the treatment column for removing residues of the liquid stream that is treated from the solids;
6. an inlet for regenerated solids at the top of the treatment column;



7. an outlet at the top of the treatment column for removing treated liquid;
b. a first counterpressure chamber connected to the bottom of the treatment column for receiving washed and loaded solids from the treatment column, said first counterpressure chamber including:
1. an inlet at its bottom for receiving a transport liquid required for circulation of the solids out of said first counterpressure chamber;
2. an outlet at its bottom for removal of loaded and washed solids;
c. a regeneration column for regenerating the solids used in the treatment column, said regeneration column including:
1. at least one plate;
2. a heating and cooling jacket;
3. means in the bottom of the column for finely dispersed feeding of a regeneration solution for regenerating the solids;
4. an inlet at the top of the regeneration column for receiving loaded and washed solids;
5. an outlet at the upper end of the regeneration column for the regenerating solution;
6. an outlet for transport liquid at the top of the regeneration column;
d. a second counterpressure chamber connected to the bottom of the regeneration column for receiving regenerated solids from the regeneration column, said second counterpressure chamber including:
1. an inlet at its bottom for receiving a transport liquid which circulates the regenerated solids from the second counterpressure chamber to the treatment column;
2. an outlet at its bottom for removal of the regenerated solids;
e. a first valveless connection line connecting the outlet for regenerated solids at the bottom end of the counterpressure chamber of the regeneration column with the inlet for the solids at the top of the treatment column; and
f. a second valveless connection line connecting the outlet for removing solids at the bottom end of the counterpressure chamber of the treatment column with the inlet for the loaded and washed solids at the top of the regeneration column.

3,926,808
SEWAGE TREATMENT SYSTEM
Clarence C. Goddard, 902 21st St., N.W., Albuquerque, N. Mex. 87104
Filed Sept. 7, 1973, Ser. No. 395,253
Int. Cl.[2] C02C 1/08
U.S. Cl. 210—195 **3 Claims**



1. An aerobic, aeration, ultraviolet ray, sewage treatment system to be installed in any size or type of housing, single or community, comprising in combination:
a plurality of imperviously lined influent, recirculation, aeration channels, connected in series;
a raw sewage inlet to the first of said influent channels;
a divider box;
an inlet from the final influent channel to said divider box;
a plurality of imperviously lined effluent, aeration channels, connected in series;
an outlet from the divider box to the first of said effluent aeration channels;
a recirculating sump;
an outlet from the divider box to said recirculating sump;
a recirculating sump pump;
a venturi tube aspirator with an aspirator air inlet tube for receiving the discharge from said sump pump and for discharging into the first influent recirculation, aeration channel, to diffuse air and seeding aerobic bacteria into the raw and recirculated sewage;
a screened opening from the final effluent aeration channel into the recirculation sump to dilute the recirculated and raw sewage;
a discharge trough;
an outlet weir to permit the effluent to be discharged from the final effluent channel into said discharge trough;
a scum skimmer for blocking discharge of scum through said outlet weir into said discharge trough; and
a discharge pipe from the discharge trough for connection with natural drainage.

3,926,809

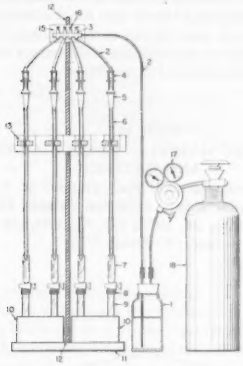
MULTI-COLUMN FRACTIONATOR

Roosevelt J. Jones, 3854 Blodgett, Houston, Tex. 77004

Filed Oct. 10, 1973, Ser. No. 396,356

Int. Cl.² B01D *15/08*

U.S. Cl. 210—198 C 3 Claims



1. In an apparatus for analyzing samples of nucleotides using a plurality of chromatograpic columns the improvement comprising in combination:

interchangeable reservoir means, each said reservoir holding an elution solvent of a different ph concentration;

a set of four chromatographic columns; a four-way multivalve control which disperses equally elution solvent of the same pH concentration on to each of said four chromatography columns at the same moment;

said columns containing ion-exchange resin capable of separating a micture of nucleotides; means connecting said valve between said reservoir and said columns;

a burette for measuring eluent volume collected from each of said chromatographic columns;

a set of collecting tubes held upright in test tube holder means;

pressure means connected to said reservoir means for forcing said elution solvent through said valve means and into each of said columns.

3,926,810

APPARATUS FOR THE AERATION OF EFFLUENT WITH OXYGEN-CONTAINING GAS

Hugo Gudernatsch; Gerhart Jaekel, both of Hermulheim; Wolfgang Kroll, Gross-Konigsdorf; Volker Oden, Cologne, and Konrad Reinhardt, Erftstadt Kierdorf, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

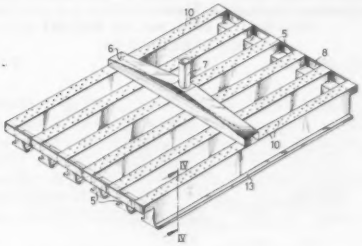
Filed June 21, 1974, Ser. No. 481,810

Claims priority, application Germany, Sept. 8, 1973, 2345405

Int. Cl.² B01F *3/04*; C02C *1/12*

U.S. Cl. 210—220 6 Claims

1. An apparatus for aerating effluents in an aeration basin, the basin being comprised of a plurality of aeration boxes placed parallel to each other, spaced apart from each other and connected together by a manifold, said aeration boxes having flattened horizontal upper sides and said upper sides being penetrated by a plurality of gas outlets, the apparatus being characterized in that the aeration boxes having a rectangular cross-sectional area and terminal surface areas, said aeration boxes comprise plastic material and are open at their bottoms; in that the aeration boxes are formed with outwardly directed flanges; in that weld seams are disposed upon said terminal surface area; in that each of the gas outlets is provided from below with a central counterbore including an



angle α of at least 90°; and in that each counterbore leaves a residual wall thickness for the plastic material between 0.5 and 2 mm.

3,926,811

FILTER-PLATE ASSEMBLY FOR FILTER PRESS

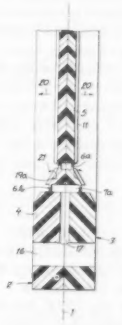
Wolfgang Ramsteck, Staig-Weinstetten, Germany, assignor to Lenser Verwaltungs-GmbH, Senden, Germany

Filed Oct. 2, 1974, Ser. No. 511,184

Claims priority, application Germany, Nov. 24, 1973, 2358578

Int. Cl.² B01D *25/12*

U.S. Cl. 210—231 10 Claims



1. A filter-plate assembly for a filter press comprising a pair of like parallel plates each unitarily formed with:

a generally rigid and planar central panel having an outer peripheral edge, the panels of said pair each having opposite faces turned toward respective filter chambers and adjacent faces in face-to-face relationship;

rigid frames each substantially coplanar with and surrounding the respective peripheral edge of each panel, said frames being in sealing relationship with one another;

fluid inlet means within said frames and in fluid communication with a space adapted to be formed between said faces in face-to-face relationship whereby fluid introduced into said space through said fluid inlet means can displace said rigid panels oppositely toward the respective filter chambers; and

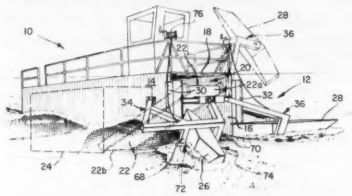
flexible web structures sealingly connected to peripheral edges of each of said generally rigid and planar central panels and to inner peripheral edges of the respective rigid frame surrounding each panel, said flexible web structures being constructed and arranged to flexibly yield upon introduction of a fluid into said space to define between said plates a substantially closed actuation chamber.

3,926,812

FLOATAGE CONCENTRATING EQUIPMENT FOR NAUTICAL FLOATAGE RECOVERY APPARATUS

Robert W. Neal, Watertown, Mass., assignor to JBF Scientific Corporation, Burlington, Mass.

Filed Sept. 3, 1974, Ser. No. 502,393
Int. Cl.[2] E02B *15/04*
U.S. Cl. 210—242 **9 Claims**



8. In buoyant nautical apparatus for the concentration and recovery of floatage from a body of water and having a vessel with a floatage-receiving bow opening and having a pair of buoyant elongated sweeps deployed forward of the vessel bow in a divergent configuration for concentrating floatage toward such opening, the improvement comprising

A. a pair of mounting booms, each of which

1. is associated with one such sweep and is mountingly affixed thereto with a pivotal connection for relative sweep-boom rotation about an axis transverse to the elongation of that sweep,
2. is mountingly affixed to said vessel with a pivotal connection for relative boom-vessel rotation about a further axis parallel to, and spaced vertically above, the associated axis of sweep-boom rotation,
3. disposes the associated boom aligned along the elongation thereof with the vessel bow opening,

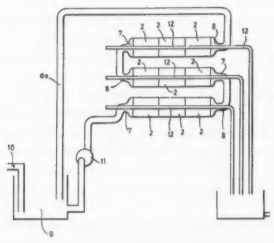
so that relative sweep-vessel motion of each such sweep is constrained about said axes associated therewith and moves such sweep relative to the vessel opening along a path that extends into such opening without sweep-vessel interference.

3,926,813

DEVICE FOR MEMBRANE FILTRATION

Warner Jan de Putter, Hardenberg, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed June 20, 1974, Ser. No. 481,251
Claims priority, application Netherlands, June 21, 1973, 738670
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—321 **7 Claims**



1. Apparatus for membrane filtration comprising:

a plurality of resin blocks arranged in spaced relation to each other, said blocks having a plurality of continuous holes disposed therethrough, the holes of each block being longitudinally aligned with the holes of the blocks adjacent thereto, the walls of said continuous holes being liquid impermeable;

a tubular membrane disposed in each of said holes and supported by said blocks for filtering a liquid passing therethrough;

sealing means associated with said blocks for enclosing the space between adjacent blocks and forming a purified liquid collecting zone therein; and

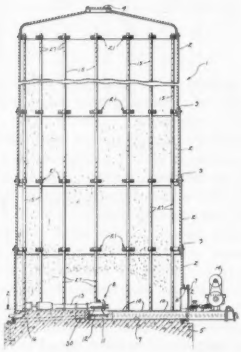
tubular means extending through said blocks for removably interconnecting said blocks and for discharging purified liquid collected, said tubular means having a plurality of openings disposed through the wall thereof whereby the purified liquid collected is withdrawn.

3,926,814

HIGH MOISTURE MATERIAL DRAINAGE STRUCTURE AND METHOD

Robert E. Hogarth, Apopka, Fla., assignor to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed Apr. 24, 1974, Ser. No. 463,528
Int. Cl.[2] E04H *7/30*
U.S. Cl. 210—323 **1 Claim**



1. In a container for the storage and drainage of high moisture material, a foundation providing a floor, a generally high tank having a metal wall secured to the foundation upon said floor and a normally closed opening at the top of the tank for entry of the material into the storage chamber provided by the tank, a plurality of circumferentially spaced thermoplastic drain pipes extending vertically of the inside of the wall of the tank for substantially the full heighth of the tank, means securing said pipes to said wall to be carried thereby, each of said pipes having vertically spaced apertures therein provided substantially from the top to the bottom of each pipe for the passage of liquid from the stored material into said pipes, a manifold extending around the tank at the bottom thereof, separate elbows at the bottom of the tank disposed to receive liquid from each of said vertical pipes, said elbows being cast in the foundation and extending substantailly flush with the top of the floor and connected to said manifold, and said elbows being of a greater diameter than the drain pipes and each drain pipe being freely received within an elbow and the diameter of each elbow being selected so that there is sufficient clearance for drainage liquid to pass from the lower portion of the tank but insufficient for silage to seep between each respective elbow and pipe.

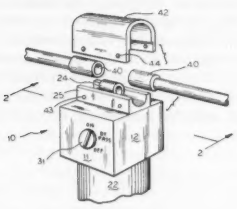
3,926,815
READILY ATTACHABLE WATER FILTER WITH CUTOFF VALVE

Robert M. McClory, Los Angeles, Calif., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Continuation of Ser. No. 402,291, Oct. 1, 1973, abandoned. This application Feb. 19, 1975, Ser. No. 550,999

Int. Cl.² B01D *35/02, 29/42*

U.S. Cl. 210—424 **5 Claims**



1. A fluid filtering system comprising:

a filter housing including a filter means,

a mounting block coupled to said filter housing, said mounting block including conduit means for directing supply fluid to said filter means and for directing filtered fluid from said filter means,

elongate trough means disposed on said mounting block, said trough means being generally semi-circular in cross-section,

generally tubular supply pipe sealing means disposed at one end of said trough means,

generally tubular filtered fluid exhaust pipe sealing means disposed at the opposite end of said trough means,

manifold means disposed intermediate said pipe sealing means, said manifold means including an inlet coupling said supply pipe sealing means and said supply fluid conduit means of said mounting block and an outlet coupling said exhaust pipe sealing means and said filtered fluid conduit means of said mounting block,

means within said manifold means for preventing fluid flow from said manifold inlet to said manifold outlet other than through said conduit means, and

cover means for said trough means which when attached to said trough means forms a leakproof seal around said supply and exhaust pipe sealing means and said manifold means.

3,926,816
TEXTILE FIBER LUBRICANTS

Norman R. Cohen, Charlotte, N.C., and Demosthenes S. Syrmopoulos, Cohasset, Mass., assignors to George A. Goulston Company, Scituate, Mass.

Continuation-in-part of Ser. No. 39,852, May 22, 1970, abandoned. This application July 23, 1973, Ser. No. 381,762

Int. Cl.² D06M *13/32;* **C10M** *1/46*

U.S. Cl. 252—8.9 **10 Claims**

1. A coning oil consisting essentially of from about 50 to about 95% of an inert carrier liquid and from about 5 to about 50% of a textile-fiber lubricant base, said lubricant base consisting essentially of:

A. from about 2 to about 20% of sodium or potassium ethoxylated alkyl phosphate ester, said alkyl radical having 6–18 carbon atoms said ester being ethoxylated with from about 2 to about 6 moles of ethoxy groups per mole of ester;

B. from about 15 to about 50% alkyl ester of a fatty acid, said alkyl radical having 10–18 carbon atoms and said fatty acid containing 6–22 carbon atoms;

C. from about 25 to about 45% polyoxyethylene lauryl ether comprising a reaction product of lauryl alcohol with from 3–6 moles of ethoxy groups per mole of lauryl alcohol; and,

D. from about 5 to about 25% polyoxyethylene tridecyl ether comprising a reaction product of tridecyl alcohol with from 3–9 moles of ethoxy groups per mole of tridecyl alcohol.

3,926,817
GLIDANTS AND PROCESS FOR PREPARING THE SAME

Eiichi Nakajima; Tadashi Morioka; Kozo Kurihara, and Takashi Kobayashi, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Continuation of Ser. No. 336,372, Feb. 27, 1973, abandoned. This application July 29, 1974, Ser. No. 492,786

Claims priority, application Japan, Mar. 27, 1970, 45-25756

Int. Cl.² C10M *1/40, 3/34, 5/16, 7/22*

U.S. Cl. 252—11 **9 Claims**

1. A glidant comprising a major amount of a glidant substance selected from the group consisting of a higher fatty acid, a calcium salt thereof, a magnesium salt thereof, and a solid hydrogenated vegetable oil, treated with a solvent solution containing a surface active agent in an amount sufficient to improve dissolution of the glidant substance, said solvent being a solvent for said surface active agent and a non-solvent for said glidant substance, followed by drying and pulverization.

3,926,818
COMPOSITE BEARING MATERIALS

Clarence E. Albertson, Villa Park, and Robert H. Krueger, Palatine, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 16, 1974, Ser. No. 532,781

Int. Cl.² C10M *5/00, 7/00*

U.S. Cl. 252—12.4 **5 Claims**

1. A pre-form composite useful for making bearing structures consisting of a core or center comprising a fiber glass filled resin and at least one outer surface comprising milled fiber glass and solid lubricant filled resin.

2. The pre-form composite of claim **1** wherein the core is comprised of a phenolic resin and glass fiber, and the outer surface is comprised of a phenolic resin and milled glass fiber and solid lubricant selected from the group graphite, poly(tetrafluoroethylene), molybdenum disulfide, and mixtures thereof.

3,926,819
LIQUID LUBRICANTS CONTAINING CRYSTALLINE SULFUR AND A SULFURIZED FAT

Edwin N. Ladov, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 343,612, March 21, 1973, abandoned. This application Oct. 29, 1974, Ser. No. 518,312

Int. Cl.² C10M *3/06, 1/38, 3/32, 5/28*

U.S. Cl. 252—31 **10 Claims**

1. A sulfurized oil containing a major proportion of a liquid lubricant, between about 0.1 and about 5% by weight of crystalline sulfur and a sufficient amount of a sulfurized fat to effectively disperse the crystalline sulfur in the liquid lubricant, said sulfur being introduced into said liquid lubricant, in the presence of said sulfurized fat, at a temperature within the range of about 180°F. to about 220°F and the resulting mixture being maintained at said temperature until substantially complete dissolution of the sulfur has occurred.

5. A process for treating a liquid lubricant composition selected from the group consisting of oils of lubricating viscosity and greases thereof, which comprises heating amorphous sulfur to the crystalline hydrocarbon-soluble form and incorporating crystalline sulfur thus produced into said liquid lubricant composition at a temperature between about 180°F to

about 220°F. in the presence of a dispersing agent comprising a sulfurized fat.

3,926,820

GREASE COMPOSITIONS

Joseph J. Dickert, Jr., Lower Makefield Township, Pa., and El-Ahmadi I. Heiba, Princeton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 23, 1974, Ser. No. 507,024
Int. Cl.[2] C10M *1/40, 3/34, 5/22, 7/38*
U.S. Cl. 252—33 12 Claims

1. A grease composition comprising a major proportion of an oil of lubricating viscosity and a thickening amount of a salt of a C-alkyl or alkenyl succinimidoarylsulfonic acid having from about 14 to about 30 carbon atoms in the alkyl or alkenyl group.

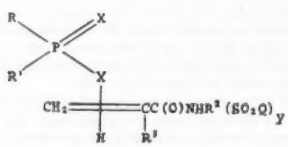
3,926,821

PHOSPHORUS, NITROGEN AND SULFO-CONTAINING ADDITIVES

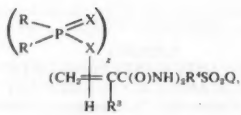
William Monroe LeSuer, Cleveland, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Filed Dec. 12, 1973, Ser. No. 424,246
Int. Cl.[2] C10M *1/48*
U.S. Cl. 252—46.7 8 Claims

1. A lubricating oil comprising a major amount of oil and a minor amount of at least one additive sufficient to impart improved load-carrying properties thereto wherein said additive is a sulfo-, nitrogen- and phosphorus-containing additive selected from those corresponding to the formulae:



and



and mixtures of two or more such additives wherein z is one or two, each X is independently oxygen or divalent sulfur, R is hydrogen or a hydrocarbyl, hydrocarbyloxy, or hydrocarbyl mercapto group of about one to about 30 carbon atoms, and R′ is XM or R, M being a hydrogen, an equivalent of a metal or ammonium cation, with the proviso that the total number of carbon atoms in both R and R′ is at least two, y is one or two, each R^3 is independently hydrogen or lower alkyl group of one to seven carbon atoms, R^2 is di- or trivalent hydrocarbyl group having one to 18 carbon atoms, R^4 is a trivalent hydrocarbyl group having one to 18 carbon atoms, and Q is selected from the group consisting of —OH, —OR^3, —OM, —O(Alkylene—O)$_n$—R^3, —N(R^3)$_2$, —NR^3 (Alkylene-NR^3)$_n$$R^3$, —OH($R^3$)$_4$, and —$ONR_3^3$- (Alkylene-$NR^3$)$_n$ R^3, wherein n has an average value of about one to about 10, M is as defined above and the alkylene group has from one to 10 carbon atoms.

3,926,822

NOVEL SULFUR-CONTAINING COMPOSITIONS

Emile Najib Habiby, Willowick, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Continuation of Ser. No. 178,803, Sept. 8, 1971, abandoned. This application Jan. 14, 1974, Ser. No. 433,338
Int. Cl.[2] C10M *1/38, 3/32, 5/28, 7/36*
U.S. Cl. 252—48.6 11 Claims

1. A lubricating composition comprising a major amount of a lubricating oil and a minor amount, effective to improve extreme pressure or "slip" properties or inhibit rust formation, of a sulfurized composition of matter prepared by reacting, at about 100°–250°C., sulfur with a mixture comprising (A) 100 parts by weight of at least one fatty acid ester of a polyhydric alcohol, (B) about 2–50 parts by weight of at least one fatty acid, and (C) about 25–400 parts by weight of at least one aliphatic α-olefin containing about 8–36 carbon atoms.

3,926,823

TURBINE OIL COMPOSITIONS

Albert M. Durr, and Robert A. Krenowicz, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Oct. 7, 1974, Ser. No. 512,766
Int. Cl.[2] C10M *1/10, 3/02, 5/02, 7/02*
U.S. Cl. 252—49.9 17 Claims

1. A turbine oil composition comprising a major amount of a mineral or synthetic hydrocarbon base lubricating oil and the following combination of materials in the amounts specified, as weight percent of total composition:

a. about 0.1 to about 1.0 — copolymer of 1 mole N-vinyl-2-pyrrolidone and 0.5 to 12 moles of an α-olefin containing 8 to 30 carbon atoms;

b. about 0.05 to about 1.5 — triphenyl phosphite or trialkyl-substituted phenyl phosphite, wherein the phenyl moiety has 1 or 2 alkyl groups, each of which contains 1 to 12 carbon atoms; and

c. about 0.002 to about 0.1 — benzotriazole or alkyl-substituted benzotriazole having 1 or 2 alkyl groups containing 1 to 10 carbon atoms.

3. The turbine oil composition of claim 2 wherein it contains from about 1 to about 15 weight percent tricresyl phosphate.

3,926,824

ELECTROSTATOGRAPHIC DEVELOPER COMPOSITION

Anthony F. Lipani, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 214,491, Dec. 30, 1971, abandoned. This application July 24, 1972, Ser. No. 274,394
Int. Cl.[2] G03G *9/00, 13/14, 9/02*
U.S. Cl. 252—62.1 9 Claims

1. An electrostatographic developer, comprising: finely-divided toner particles of a single type and carrier therefor of a single type, the carrier particles being larger than the toner particles, at least the surface of the carrier being formed of at least two incompatible materials one of which is triboelectrically negative with respect to said toner and the other of which is triboelectrically positive with respect to said toner, and said incompatible materials are capable of imparting both a negative and a positive charge to said toner, whereby said toner electrostatically adhering to said carrier is both negatively and positively charged on said carrier, the toner of one polarity capable of being deposited in the image area during development and the toner of the other polarity capable of being deposited in at least the background area immediately adjacent the image area during development.

3,926,825

LIQUID DEVELOPER COMPOSITION AND PROCESS FOR PREPARING SAME

Satoru Honjo; Yasuo Tamai, and Nobuo Tsuji, all of Tokyo, Japan, assignors to Xerox Corporation, Stamford, Conn.

Filed May 29, 1973, Ser. No. 364,848
Int. Cl.[2] G03G 9/12
U.S. Cl. 252—62.1 12 Claims

1. A liquid developer composition for use in developing a recording surface bearing an electrostatic latent image, said developer composition consisting essentially of finely divided colored marking particles substantially homogenously dispersed in a carrier liquid, said colored marking particles being substantially completely covered with a positive charge adjusting agent which is substantially insoluble in said carrier liquid, said charge adjusting agent consisting essentially of a solid terpolymer of (1) from about 5 to about 94.5% by weight of a polymerizable styrene composition, (2) from about 94.5 to about 5% by weight of a composition selected from the group consisting of polymerizable acrylate and methacrylate esters, and (3) from about 0.5 to about 50% by weight of a polymerizable organo silicone composition selected from the group consisting of organo silanes, silanols, and siloxanes having from 1) to 3 hydrolyzable groups and an organic group attached directly to a silicone atom containing an unsaturated carbon-to-carbon linkage, said terpolymer having a weight average molecular weight of at least about 5,000.

10. A process for preparing a liquid developer composition for use in developing a recording surface bearing an electrostatic latent image, said process comprising the steps of mixing colored marking particles with a positive charge adjusting agent which is insoluble in a carrier liquid, the amount of said positive charge adjusting agent being sufficient to substantially completely cover said colored marking particles, and said charge adjusting agent consisting essentially of a solid terpolymer of (1) from about 5 to about 94.5% by weight, of a polymerizable styrene composition, (2) from about 94.5 to about 5% by weight of a composition selected from the group consisting of polymerizable acrylate and methacrylate esters, and (3) from about 0.5 to about 50% by weight of a polymerizable organo silicone composition selected from the group consisting of organo silanes, silanols, and siloxanes having from 1 to 3 hydrolyzable groups and an organic group attached directly to a silicone atom containing an unsaturated carbon-to-carbon linkage, said terpolymer having a weight average molecular weight of at least about 5,000, and dispersing said mixture in a carrier liquid having an electrical resistance greater than about 10^{10} ohms-cm and a dielectric constant less than about 3.5.

3,926,826

MAGNETIC TAPE BINDER FROM A POLYURETHANE, A POLYOL AND AN ISOCYANATE

Boynton Graham, Wilmington, and H. Gilbert Ingersoll, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 18, 1973, Ser. No. 370,714
Int. Cl.[2] H01F 1/113, 1/28
U.S. Cl. 252—62.54 13 Claims

1. In a magnetic recording composition of the type comprising a plurality of ferromagnetic particles dispersed in a polymeric resin binder, the improvement wherein said binder is formed by the reaction of a polyol and a polyfunctional isocyanate in the presence of a preformed, non-reactive polyurethane, said non-reactive polyurethane being selected from the group consisting of polyetherpolyurethane and polyesterpolyurethane and said polyol being selected from the group consisting of linear or branched aliphatic diols and triols, polymeric carboxylic esters having a molecular weight greater than 200 and hydroxyl numbers in the range 1 to 500, and addition polymers having available pendant reactive hydroxyl groups, the total binder composition comprising 1 to 50% by weight of the polyol constituent, 2 to 30% by weight of the polyfunctional isocyanate constituent, and 25 to 85% by weight of the polyurethane constituent.

3,926,827

METHOD FOR MAKING DETERGENT COMPOSITIONS

John Kilolo Mangeli, Kalama Location, Kenya, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 29, 1973, Ser. No. 346,067
Int. Cl.[2] C11D 11/00, 7/18, 7/38
U.S. Cl. 252—99 5 Claims

1. In a process for the preparation of a particulate detergent composition wherein about 15–40% water, about 2–65% organic detergent, less than about 20% hydrotrope, about 9–26% of aqueous inorganic silicate solution, about 2–20% of inorganic salt filler, about 10–75% of a hydratable salt selected from the group consisting of Form II pentasodium tripolyphosphate and Form I pentasodium tripolyphosphate and about 0.25–1% of an oxygen-liberating percompound are mixed to form a paste capable of retaining small oxygen bubbles without substantial coalescence thereof, liberating oxygen from said percompound into said paste in an amount sufficient to bleach said paste and to expand said paste to a final volume at least two times the initial volume thereof, setting the expanded paste under quiescent conditions to a friable mass of substantially said final volume, and granulating said friable mass to form particles of a bleached detergent composition, the improvement comprising adding said hydratable salt prior to the addition of said filler whereby the hydratable salt is more effectively hydrated resulting in more uniform particles having less fines and having an apparent density of less than about 0.32 gram per cubic centimeter.

3,926,828

METHOD OF MAKING TRANSPARENT SOAP BARS

John J. O'Neill, Cresskill; Joseph A. Komor, Ramsey; Thomas E. Babcock, Mahwah, all of N.J.; Robert J. Edmundson, Cornwall, and Edward G. Shay, Suffern, both of N.Y., assignors to Avon Products, Inc., Suffern, N.Y.

Division of Ser. No. 191,794, Oct. 22, 1971, Pat. No. 3,793,214. This application Sept. 11, 1973, Ser. No. 396,230
Int. Cl.[2] C11D 7/32, 13/16, 17/00
U.S. Cl. 252—117 4 Claims

1. The method of making transparent soap bars comprising the steps of admixing at a temperature of from about 130°F to 210°F about 25 to 75 parts by weight based on the total weight of the combined components of a C_{12}–C_{18} saturated straight chain fatty acid and about 10 to 20 parts by weight based on the total of the combined components of a branch chain C_5–C_{18} saturated unsubstituted aliphatic monocarboxylic acid to form a substantially homogeneous mixture, neutralizing said acids of said mixture, while maintaining the mixture at said temperature, by adding thereto a neutralizing agent in an amount at least sufficient to neutralize said acid, and cooling said mixture; said neutralizing agent consisting essentially of an alkaline sodium compound present in an amount sufficient to neutralize from about 40 to 80 percent of the acids and an ethanolamine selected from diethanolamine, triethanolamine and mixtures thereof in an amount above that required for neutralization.

3,926,829

SUPERFATTED SOAP AND PROCESS OF PRODUCING IT

Brian Robson Smith, Chadderton, and Kenneth Tomlinson, Bramhall, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 366,546, June 3, 1973, abandoned, which is a continuation of Ser. No. 167,877, July 30, 1971, abandoned, which is a continuation of Ser. No. 730,634, May 20, 1968, abandoned. This application Mar. 20, 1974, Ser. No. 453,166

Int. Cl.² C11D 9/48, 11/04, 13/00

U.S. Cl. 252—132 3 Claims

1. The process of producing soap characterized by a higher ratio of saturated fatty acids to unsaturated fatty acids in a neat soap phase than in a nigre phase comprising:

1. adding to an alkali metal soap selected from the group consisting of sodium soap and a mixture of sodium soap and up to 15% potassium soap, said soap being obtained by saponifying a fatty mixture of 40–90% tallow and 10–60% coconut oil with sodium hydroxide and precipitating with salt, just prior to the fitting stage a sufficient quantity of hydrochloric acid to produce a free fatty acid content of about 4% to about 15% based on the total fatty acid content of said soap and to form a salt by neutralizing any remaining sodium hydroxide and
2. separating the acidified soap into neat soap and nigre, and working up the neat soap into bars.

3,926,830

DETERGENT COMPOSITION HAVING POLYMER BONDED INDICATOR

Shojiro Horiguchi, Hoya; Michiei Nakamura, Soka; Keiji Nakajima, and Yoshio Seino, both of Tokyo, all of Japan, assignors to Dainichiswika Color & Chemicals Mfg. Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 194,036, Oct. 29, 1971. This application Mar. 5, 1973, Ser. No. 338,278

Claims priority, application Japan, Nov. 25, 1970, 45-103279

Int. Cl.² C11D 3/37

U.S. Cl. 252—135 7 Claims

1. A detergent composition consisting essentially of a synthetic organic detergent selected from the group consisting of anionic, nonionic, cationic and amphoteric surface active agents and mixtures thereof and 0.1–50% by weight of a pH indicative polymer, based on the weight of said detergent, wherein said pH indicative polymer consists of a pH indicator bonded to a polymer and which is soluble or dispersable in an aqueous solution of the detergent.

3,926,831

DRY-CLEANING AGENT

Erhard Sonnengrüber, Eigerstrasse 46, 8000 Munich 82, Germany

Continuation-in-part of Ser. No. 271,035, July 12, 1972, abandoned. This application June 18, 1974, Ser. No. 480,492

Int. Cl.² C11D 7/50

U.S. Cl. 252—171 4 Claims

1. A dry-cleaning agent consisting essentially of a chlorinated hydrocarbon containing an effective amount of a surfactant,

I. said effective amount of surfactant containing as a mixture at least 75% by weight of an exthoxylate component having the general formula:

$$A—O—(CH_2—CH_2—O)_n—OH$$

wherein $n = 2$ to 30

wherein A is a member of the group consisting of:

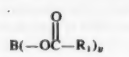
a. naphthyl or phenyl, optionally substituted with from 1 to 3 C_1—C_{10}-alkyl groups with the proviso that the number of total substituents carbon atoms does not exceed 18,

b. branched C_3—C_{12}-alkyl groups,

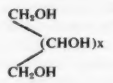
c. straight chain C_4—C_{12}-alkyl groups,

d. C_4—C_{17}-acyl groups

e. the residue of a fatty acid ester of the formula

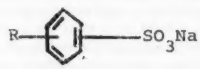


wherein $y = 1$ to 3; $R_1 = C_5$—C_{17}-alkyl or -alkenyl groups (branched or straight chain), and B is derived from



wherein $x = 1$ to 4 or an anhydride of this compound with the proviso that if $x = 1$, y is 1 or 2 and that at least one OH is esterified with ethylene oxide to form the ethoxylate component whereas at least one of the remaining OH groups is etherified with the fatty acid residue

II. said surfactant having a sulfonate component ranging up to about 25% by weight of the mixture having the general formula:



wherein R = C_8—C_{18} of branched or straight chain alkyl groups, said component acting as a solubilizer;

said ethoxylate component and said sulfonate component together having an HLB-value of 13 to 18 and being free of water.

3,926,832

GETTERING STRUCTURE

Aldo Barosi, Milan, Italy, assignor to S.A.E.S. Getters S.p.A., Milan, Italy

Filed July 30, 1973, Ser. No. 383,677

Claims priority, application Italy, Aug. 10, 1972, 28053/72

Int. Cl. H01j 7/18, 35/20, 1/50

U.S. Cl. 252—181.6 5 Claims

1. A gettering structure comprising:

A. a sintered particulate non-evaporable getter metal selected from the group consisting of Zr, Ta, Hf, Nb, Ti, Th and U,

B. a particulate zirconium-aluminum alloy comprising 5 to 30 weight percent aluminum balance zirconium wherein the particles of the zirconium-aluminum alloy are larger than the particles of the non-evaporable getter metal and are distributed throughout the non-evaporable getter metal wherein the weight ration A:B is from 19:1 to 2:3 **and wherein said particles of zirconium-aluminum alloy are generally spaced out of contact with each other.**

3,926,833

PREPARATION OF MIXED CHLOROHYDRIDES OF ALUMINUM

Doyt K. Hoffman, and Ricardo O. Bach, both of Gastonia, N.C., assignors to Lithium Corporation of America, New York, N.Y.

Filed Mar. 21, 1973, Ser. No. 343,266

Int. Cl.² C01B 6/06; C01F 7/56

U.S. Cl. 252—188 16 Claims

1. In a method of preparing liquid solutions of aluminum compounds corresponding to the formula AlH_xHal_{3-x} where x is 0 and up to but not including 3, the steps which comprise reacting an alkali metal hydride with $AlHal_3$, where Hal is halogen selected from the group consisting of chlorine, bromine and iodine, in a mole ratio of about 1 to 4 moles of said alkali metal hydride to 1 mole of said $AlHal_3$, in a liquid me-

dium comprising a dialkyl ether of a glycol selected from the group consisting of ethylene glycol, propylene glycol and their polyglycols, said glycol containing from 2 to 8 carbon atoms, the alkyls of said dialkyl radical containing from 1 to 3 carbon atoms, whereby to produce a final concentration between about 0.1 and 2 moles of the AlH_xHal_{3-x} per liter in said solutions.

8. In a method of preparing liquid aromatic hydrocarbon solutions of mixed chlorohydrides of aluminum, the steps which comprise:

a. providing a slurry of LiH in a dialkyl ether of a member selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol and tetraethylene glycol and in which each alkyl contains from 1 to 2 carbon atoms,

b. providing a solution of $AlCl_3$ in at least one liquid aromatic hydrocarbon selected from the group consisting of benzene and toluene, said solution also containing dimethyl ether, the volume ratio of said dialkyl ether to said hydrocarbon being from 1 to 4 of said dialkyl ether to 1 of said hydrocarbon,

c. the ingredients being proportioned so that the mole ratio of LiH to $AlCl_3$ in the (a) and (b) compositions is about 1 to 4 of LiH to 1 of $AlCl_3$, and

d. gradually adding the (b) solution to the (a) slurry, whereby to produce a final concentration between about 0.1 and 2 moles per liter of the mixed chlorohydrides of aluminum in said solutions.

3,926,834

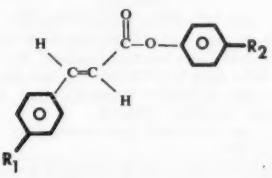
LOW MELTING POINT DISUBSTITUTED-P,P'-PHENYL CINNAMATE LIQUID CRYSTALS

Freeman B. Jones, Jr., Westlake Village, and Joseph J. Ratto, Thousand Oaks, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 1, 1973, Ser. No. 402,531
Int. Cl.² C09K *3/34*; **C07C** *69/76*
U.S. Cl. 252—299 **10 Claims**

1. A nematic liquid crystal,

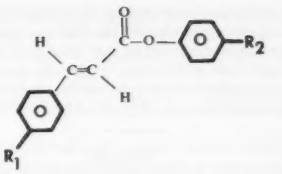
selected from the group consisting of cinnamic acid esters of the formula



wherein R_1 can be C_xH_{2x+1}, $C_xH_{2x+1}O$, $C_xH_{2x+1}CO_2$; and R_2 can be C_yH_{2y+1}, $C_yH_{2y+1}O$ and $C_yH_{2y+1}CO_2$ and where x and y are integers with $1 \leq x \leq 10$ and $1 \leq y \leq 10$, and

said nematic liquid crystal having a melting point of less than 95°C.

3. A nematic liquid crystal composition comprising a mixture of a plurality of nematic liquid crystal selected from the group consisting of cinnamic acid esters of the formula



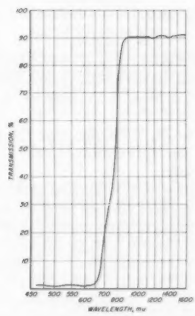
wherein R_1 can be C_xH_{2x+1}, $C_xH_{2x+1}O$, and $C_xH_{2x+1}CO_2$; and R_2 can be C_yH_{2y+1}, $C_yH_{2y+1}O$, and $C_yH_{2y+1}CO_2$, where x and y are integers with $1 \leq x \leq x \leq 11$ and $1 \leq y \leq 11$.

3,926,835

INFRARED TRANSMITTING FILTER CONTAINING 1,4,5,8-TETRACYCLOHEXYLAMINOANTHRAQUINONE

Robert Jerome Tucker, Hackettstown, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 120,237, March 2, 1971. This application June 8, 1973, Ser. No. 368,385
Int. Cl.² G02B *5/22*
U.S. Cl. 252—300 **2 Claims**



1. An optical filter which is substantially opaque to radiation in the visible region but which permits high transmission in the near infrared region comprising a plastic film having incorporated therein a mixture of organic dyes which provide absorption of substantially all visible light up to about 650 mu and the compound 1,4,5,8-tetracyclohexylaminoanthraquinone, the weight percent concentration of said compound in said film being such that said concentration multiplied by the thickness of the film equals a constant falling within the range of from 0.25 to 3.5 corresponding to a degree of opacity in the visible region of from 98% to 100%.

3,926,836

PROCESS FOR PREPARING PHOSPHOR FOR THERMOLUMINESCENT RADIATION DOSIMETER

Naohiro Nada, Nishinomiya, and Tadaoki Yamashita, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 28, 1971, Ser. No. 138,118
Claims priority, application Japan, May 29, 1970, 45-46730The portion of the term of this patent subsequent to Jan. 25, 1989, has been disclaimed.
Int. Cl. C09k *1/10*
U.S. Cl. 252—301.4 R **2 Claims**

1. A process for producing a phosphor for a thermoluminescent radiation dosimeter, which comprises mixing a raw material beryllium oxide with at least one activator selected from the group consisting of sulfates, carbonates and hydroxides of

lithium, sodium and potassium in an amount capable of producing said phosphor wherein the lithium, sodium or potassium is present in an amount of more than 0.5% and up to 10% by mole per mole of beryllium oxide and then sintering the mixture in a covered crucible in a sintering furnace at a temperature of 1,500°C to 2,100°C for 3 to 24 hours.

3,926,837

METHOD FOR THE PREPARATION OF EUROPIUM ACTIVATED YTTRIUM OXYSULFIDE

Eugene A. Graff, Cedar Grove, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1974, Ser. No. 518,914

Int. Cl.² C09K *11/14, 11/46*

U.S. Cl. 252—301.4 S **3 Claims**

1. Method for preparing a europium activated yttrium oxysulfide phosphor of the formula $Y_{2-x}O_2S$: Eu_x, wherein x has a value between about 0.001 and about 0.1 using a raw mix containing all phosphor constituents in solid form and using a single firing in double covered trays, said method comprising:

a. preparing a raw mix containing yttrium oxide and europium oxide in amounts stoichiometric to produce yttrium oxysulfide phosphor and also containing sodium thiosulfate in an amount at least five times the amount stoichiometric for yttrium oxysulfide phosphor; and

b. singly firing said raw mix, at a temperature of about 900°–1300°C in double covered trays.

3,926,838

TRANSPARENT, CRYSTALLINE, CATHODOLUMINESCENT MATERIALS

Richard F. Reade, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 9, 1974, Ser. No. 530,812

Int. Cl.² C09K *11/08*

U.S. Cl. 252—301.4 F **2 Claims**

1. A transparent glass body exhibiting cathodoluminescence having at least an integral surface layer comprising divalent manganese doped mu-cordierite crystals homogeneously dispersed within a glassy matrix, said glass body consisting essentially, by weight on the oxide basis, of about 8–16% MgO, 27–40% Al_2O_3, 44–63% SiO_2, and 0.25–2% MnO, wherein said crystals are visually indistinguishable from the parent glass and constitute at least 50% by volume of the crystallized surface portion of said body.

3,926,839

HYDROCARBON SOLUTION CONTAINING A SURFACTANT AND AN ALKYL PHENOL USED IN AN ALKYLATION PROCESS

Frederic C. McCoy, Beacon, and Edward L. Cole, Fishkill, both of N.Y., assignors to Texaco, Inc., New York, N.Y.

Division of Ser. No. 370,195, June 14, 1973, Pat. No. 3,870,765. This application July 1, 1974, Ser. No. 484,366

Int. Cl.² B01F *17/26, 17/16, 17/18, 3/08*

U.S. Cl. 252—355 **4 Claims**

1. A liquid solution useful in a strong acid-catalyzed alkylation reaction for improving alkylate quality and for reducing acid catalyst consumption, which liquid solution comprises:

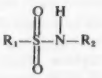
a. about 5 to 15 percent of an alkylation aid selected from the group consisting of primary aliphatic amines having from 12 to 24 carbon atoms in the aliphatic radical, ammonium salts having at least one aliphatic radical of from 12 to 24 carbon atoms, phosphonium salts having at least one aliphatic radical of about 12 to 20 carbon atoms and sulfonium salts having at least one aliphatic radical of from about 12 to 20 carbon atoms;

b. about 40 to 90 percent hydrocarbon solvent boiling in the gasoline boiling range; and

c. alkyl phenol solubilizing agent, in a weight ratio to alkylation aid of from about 1:1 to about 10:1, wherein said alkyl phenol is selected from the group consisting of mono- and di-nuclear aromatics having at least one phenolic hydroxyl group and having at least one aliphatic side chain of 6 to 50 carbon atoms.

3. A liquid solution useful in a strong acid catalyzed alkylation reaction for improving alkylate quality and for reducing acid catalyst consumption, which liquid solution comprises:

a. about 5 to 15 percent of a sulfonamide alkylation aid having the formula:



Wherein R_1 is selected from alkyl, aromatic, and alkyl aromatic, and wherein R_2 is alkyl of from about 8 to 30 carbon atoms;

b. about 40 to 90 percent hydrocarbon solvent boiling in the gasoline boiling range; and

c. alkyl phenol solution aid, in a weight ratio to alkylation aid of from about 1:1 to about 10:1 wherein said alkyl phenol is selected from the group consisting of mono- and di-nuclear aromatics having at least one phenolic hydroxyl group and having at least one aliphatic side chain of 6 to 50 carbon atoms.

3,926,840

EMULSIFIERS OF WATER-IN-OIL CREAMS

Ingrid Wendler, Dusseldorf-Wersten, and Jurgen Malaszkiewicz, Dusseldorf, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Filed Aug. 15, 1973, Ser. No. 388,557

Claims priority, application Germany, Aug. 21, 1972, 2241016

Int. Cl.² B01F *17/34*

U.S. Cl. 252—356 **10 Claims**

1. An emulsifier combination for use in preparing creams of the water-in-oil type consisting of (A) vegetable sterols and (B) an ester mixture selected from the group consisting of (1) monoesters of oleic acid with polyols having at least 3 hydroxyl groups in the molecule and polyesters of oleic acid with polyols having at least 3 hydroxyl groups in the molecule, (2) monoesters of ricinoleic acid with polyols having at least 3 hydroxyl groups in the molecule and polyesters of ricinoleic acid with polyols having at least 3 hydroxyl groups in the molecule, and (3) and the mixtures of (1) and (2) above, the weight ratio of said ester mixture to said vegetable sterols ranging from 90:10 to 50:50, with the proviso that the amount of free hydroxyl groups in said ester mixture exceeds the amount of esterified hydroxyl groups in said ester mixture.

3,926,841

ANTI-CAKING COMPOSITION

Werner Habasko, and Rudolf Syrovatka, both of Vienna, Austria, assignors to Lever Brothers Company, New York, N.Y.

Filed June 1, 1973, Ser. No. 365,885

Claims priority, application United Kingdom, June 5, 1972, 26048/72; Jan. 15, 1973, 1995/73

Int. Cl.² C05G *3/00;* **C09K** *3/00*

U.S. Cl. 252—383 **6 Claims**

1. a composition for reducing caking of fertilizer particles comprising:

1. 1 to 20 percent by weight of a cationic aliphatic amine selected from the group consisting of amines having the formulae RR_1R_2N and $RNHCH_2CH_2CH_2NH_2$, wherein R is an aliphatic hydrocarbon radical containing from 8 to 22 carbon atoms and R_1 and R_2 are selected from the group consisting of H and alkyls containing 1 to 22 carbon atoms;

2. 3 to 80 percent by weight of a carboxylic acid selected from the group consisting of aliphatic and cycloaliphatic

carboxylic acids having from 8 to 22 carbon atoms in the molecule;

3. 0.1 to 5 percent by weight of an alkali selected from the group consisting of lower alkanol amines wherein the alkanol moiety has from 2 to 4 carbon atoms and hydroxides selected from the group consisting of magnesium, zinc, nickel and aluminium hydroxide; and,
4. up to 90 percent by weight of an inert organic solvent selected from the group consisting of mineral oils, waxes, polyethylene glycols and mixtures thereof.

3,926,842
METHOD OF REGENERATING SPENT HYDROALKYLATION CATALYST CONTAINING AN OXIDIZABLE GROUP VIII METAL

Robert M. Suggitt, Wappingers Falls, and John M. Crone, Jr., Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

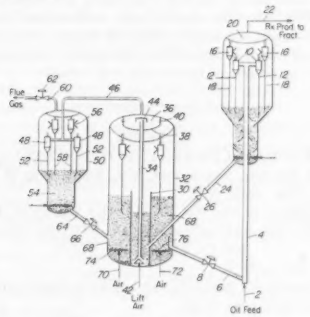
Filed Jan. 2, 1973, Ser. No. 320,215
Int. Cl.² B01J *23/94*; **C07C** *5/10*, *15/00*; **B01J** *29/38*
U.S. Cl. 252—411 R **6 Claims**

1. The method of regenerating a spent hydroalkylation catalyst, intially treated with hydrogen at temperatures above about 400°C, which has been used in hydroalkylation and which is characterized by a level of activity which is less than the initial level of activity, said spent catalyst containing (a) at least one oxidizable Group VIII metal selected from the group consisting of nickel and cobalt, and (b) zeolite dispersed in a silica-alumina matrix which comprises heating said spent catalyst, in the presence of gas containing at least 30 mole percent hydrogen and being substantially free of active components which are capable of reacting with any of the materials in the system, to regeneration temperature of 310°C–650°C for 1–24 hours thereby regenerating said spent hydroalkylation catalyst.

3,926,843
FCC — MULTI-STAGE REGENERATION PROCEDURE

Hartley Owen, Belle Mead, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 26, 1973, Ser. No. 345,053
Int. Cl.² B01J *29/38*, *21/20*
U.S. Cl. 252—417 **4 Claims**



1. A method for regenerating a hydrocarbon cracking catalyst comprising crystalline aluminosilicate containing carbonaceous deposits which comprises,

a. passing hydrocarbon cracking catalyst containing carbonaceous deposits as a first suspension in oxygen containing regeneration gas through a first riser regeneration zone,

b. combining the suspension after traverse of said first regeneration zone with gaseous products of combustion obtained from at least a third catalyst regeneration zone under conditions to convert available carbon monoxide to carbon dioxide and heat the catalyst therewith to a further elevated temperature by direct heat exchange in a segregated heat exchange zone and then cyclonically separating catalyst with carbon residue from gaseous products of combustion,

c. passing heated catalyst with carbon residue separated after said direct heat exchange step to a second regeneration zone,

d. further combusting said heated catalyst with carbon residue in a second regeneration zone under conditions to further remove carbon residue by burning in oxygen containing gas,

e. passing catalyst from said second regeneration zone to a dense fluid bed of catalyst retained in a third catalyst regeneration zone,

f. contacting said dense fluid bed of catalyst in a third regeneration zone with additional oxygen containing gases under elevated temperature catalyst regeneration conditions sufficient to produce gaseous products of combustion,

g. combining the gaseous products thus produced with the suspension of said first regeneration zone as recited above and

h. withdrawing catalyst from said third regeneration zone at an elevated temperature for use in cracking hydrocarbons.

3,926,844
CATALYSTS FOR THE CATHODIC HYDROGEN DEVELOPMENT

Gabor Benczur-Urmossy, Stuttgart, Germany, assignor to Deutsche Automobilgesellschaft mbH, Hannover, Germany

Filed Feb. 19, 1974, Ser. No. 443,195
Claims priority, application Germany, Feb. 17, 1973, 2307852
Int. Cl.² B01J *21/02*
U.S. Cl. 252—432 **19 Claims**

1. A process for the production of catalysts for the cathodic hydrogen evolution in alkaline electrolytes, which comprises growing onto surfaces suitable as an electrode base an X-ray amorphous metallic boride compound of nickel, cobalt or iron containing 5 to 8 percent by weight of boron by a reducing deposition in an aqueous solution at a temperature of below 60°C., said solution initially consisting essentially of water, metallic ions selected from the group consisting of nickel ions, cobalt ions and iron ions in an amount of from 0.02 to 0.2 mole/liter, a complexing agent for the metallic ions in a concentration of from 1 to 10 mole/liter and water-soluble boranate or borazane as reducing agent in a concentration of from 0.02 to 0.2 mole/liter, said solution having a free metallic ion of below 10^{-10} mole/liter during said growth.

3,926,845
CATALYSTS COMPOSITIONS

Robert S. Cichowski, San Luis Obispo, Calif., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 215,147, Jan. 3, 1972, Pat. No. 3,810,953.
This application Feb. 7, 1974, Ser. No. 440,483
Int. Cl.² B01J *21/02*, *27/18*
U.S. Cl. 252—432 **8 Claims**

1. A catalyst composition consisting essentially of a calcined mixture of cobalt, phosphorus and a metal promoter, Me, selected from the group consisting of indium, aluminum, yttrium, cadmium, zinc, lead and boron, characterized by the formula

$$Me_xCoP_yO_z$$

wherein x and y are numbers in the range of about 0.01 to about 5, except when Me is aluminum or lead, then x is a number in the range of about 0.1 to 1 and y is a number in the range of about 0.1 to about 0.5, and z is a number determined by the valence requirements of the calcined Me, Co and P mixture.

3,926,846
CATALYSTS FOR THE PREPARATION OF PHTHALIC ANHYDRIDE

Tetsuji Ono, Amagasaki; Yoshiyuki Nakanishi, Ikeda; Takehiko Suzuki, Takatsuki, and Yukio Okuda, Toyonaka, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Japan

Continuation-in-part of Ser. No. 300,656, Aug. 25, 1972, abandoned. This application Oct. 15, 1973, Ser. No. 406,285

Int. Cl.² B01J *27/18*

U.S. Cl. 252—435 **8 Claims**

1. A supported catalyst for the preparation of phthalic anhydride by vapor phase catalytic oxidation of either ortho-xylene or naphthalene with molecular oxygen-containing gas consisting essentially of a catalytically active substance and a porous inert carrier, said catalytically active substance consisting essentially of 1 to 20 parts by weight of V_2O_5 and, correspondingly, 99 to 80 parts by weight of TiO_2 and, based on the total weight of the V_2O_5 and TiO_2, 0.02 to 5.0% by weight of Nb_2O_5, 0.1 to 5.0% by weight of P_2O_5, 0 to 0.25 % by weight of K_2O and 0 to 0.5% by weight of Ca_2O, the total amount of the K_2O and Cs_2O being at least 0.05% by weight, said porous inert carrier having an aluminum compound content, calculated as Al_2O_3, of at most 10% by weight, SiC content of at least 50 % by weight and an apparent porosity of at least 10%, and in the supported catalytically active layer at least 50% of the total pore volume in pores of diameters less than 10 microns being in pores of diameters between 0.10 micron and 0.45 micron.

3,926,847
CATALYSTS COMPRISING A METAL HALIDE SALT ON AN INTERSTRATIFIED SYNTHETIC ALUMINOSILICATE CARRIER AND CHLORINATION PROCESSES, ETC.

William Q. Beard, Jr.; Patricia H. Moyer, and Siegfried E. Penner, all of Wichita, Kans., assignors to Vulcan Materials Company, Birmingham, Ala.

Filed June 4, 1973, Ser. No. 366,278

Int. Cl.² B01J *27/10*

U.S. Cl. 252—441 **11 Claims**

1. A catalyst composition useful for oxychlorination, the catalyst composition consisting essentially of a variable valence metal halide catalyst component deposited on a synthetic aluminosilicate carrier component, the variable valence metal halide consisting of a copper halide, the synthetic aluminosilicate having a mixed layer crystal structure with randomly alternating layers of montmorillonite-like and mica-like structure, the copper halide being present in the catalyst composition in an amount between about 2% and about 15% calculated as uncombined copper.

3,926,848
PROCESS FOR INCREASING ACTIVITY OF HEAVY TRANSITION METAL HALIDE STEREOSPECIFIC CATALYSTS

Harry Jan Wristers, and Herschel Claude Williams, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Apr. 19, 1973, Ser. No. 352,666

Int. Cl.² B01J *27/10;* **C08F** *4/00, 11/06*

U.S. Cl. 252—442 **9 Claims**

1. A process for increasing the activity of a cocrystallized $TiCl_3$·⅓ $AlCl_3$, obtained by aluminum reduction of $TiCl_4$, which is an already effective catalyst which comprises the sequential steps of dry ball milling and a heat soak treatment to remove trace quantities of materials detrimental to polymerization selected from the group consisting of: $TiCl_4$, $AlCl_3$ and combinations thereof from active catalyst sites of said catalyst by contacting said catalyst with an inert and selective solvent selected from the group consisting of benzene and heptane having a solvation affinity for said detrimental materials for ½ to 60 minutes and at a temperature of 100° to 160°C sufficient to result in a treated catalyst with increased activity, decreased waxy polymer and increased C_7-insolubles with respect to propylene polymerized with said treated catalyst, as compared to propylene polymerized with an identical catalyst that is untreated by the process hereof.

3,926,849
METHOD OF CATALYST MANUFACTURE

Edward Michalko, Chicago, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed June 10, 1974, Ser. No. 478,115

Int. Cl.² B01J *37/00, 21/04, 23/14*

U.S. Cl. 252—448 **7 Claims**

1. A method of catalyst manufacture which comprises:
a. commingling sufficient ammonia with an acid salt of tetravalent tin in aqueous solution to effect from about 50 to about 87 percent neutralization of said acid salt;
b. admixing the resultant neutralization product with an alumina sol;
c. commingling the tin-containing sol with hexamethylenetetramine;
d. dispersing the mixture as droplets in a hot oil bath effecting hydrolysis of said hexamethylenetetramine and the formation of spheroidal gel particles and aging said gel particles in said oil bath at a temperature of from about 90° to about 150°C. for a period of from about 1 to about 24 hours; and
e. washing, drying and calcining said particles in an oxidizing atmosphere to yield a spheroidal SnO_2-Al_2O_3 composite.

3,926,850
CATALYST AND PROCESS FOR THE CONVERSION OF HIGHER HYDROCARBONS

Hana Kostka, Grossgrundlach, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 26, 1973, Ser. No. 336,062

Claims priority, application Germany, Mar. 3, 1972, 2210401

Int. Cl.² B01J *29/06*

U.S. Cl. 252—455 R **18 Claims**

1. A catalyst for converting higher hydrocarbons into gas mixtures containing carbon monoxide, hydrogen, methane and carbon dioxide comprising γ-aluminum oxide, η-aluminum oxide, kaolinite containing titanium dioxide and an active component selected from the group consisting of platinum and the oxides of lanthanum and cobalt.

3,926,851
POROUS CERAMICS-EXHAUST OXIDATION CATALYST

Francis J. Sergeys, Kensington, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 82,918, Oct. 22, 1970, Pat. No. 3,755,204. This application July 17, 1973, Ser. No. 380,032

Int. Cl. B01J *11/40, 11/50*

U.S. Cl. 252—455 R **3 Claims**

1. A process for preparing an engine exhaust catalyst comprising the following steps:
a. homogeneously blending a composition consisting essentially of 15–80 volume percent of a polyolefin having a molecular weight of at least 150,000 and a standard load melt index of substantially zero, 5–67 volume percent of a ceramic filler, selected from the group consisting of alumina, mullite, zircon mullite, magnesium aluminate spinel, and cordierite, and 15–80 volume percent of a plasticizer selected from the group consisting of mineral oils, diethylene glycol, proplylene glycol, dipropylene glycol glycerin, and a glycerol monoacetate, trimethylene glycol, tetramethylene glycol, 2, 3-butylene glycol, triethyl phosphate, polyvinyl alcohol, and polyvinyl pyrrolidone,

b. heating said composition to about 125° to 175°C., molding to form a plastic sheet and impressing ribs thereon,
c. rolling said plastic sheet so that said ribs contact said sheet, heating to 150°C. to just below the burn off point to fuse the contacting areas together thermoplastically,
d. extracting said plasticizer with water or an organic solvent,
e. removing said polyolefin by heating to 240° to 700°C. to form a porous ceramic structure, and to burn off the polyolefin and,
f. firing said porous ceramic structure at a temperature of 1300° to 1450°F. for about 2 hours to sinter said porous ceramic structure,
g. coating the ceramic structure with solutions of salts of metals selected from the group consisting of the noble metals and copper, chromium and manganese and heating to reduce the noble metal salts to the metal or convert the copper chromium and manganese salts to the oxides.

3,926,852
OXIDATION CATALYSTS

Raymond M. Cahen, Brussels; Henri R. Debus, Meise, and Jacques M. J. G. Andre, Brussels, all of Belgium, assignors to Labofina S. A., Brussels, Belgium

Filed Oct. 26, 1973, Ser. No. 410,276
Claims priority, application Belgium, May 4, 1973, 130731
Int. Cl.² B01J *29/16*
U.S. Cl. 252—456 **14 Claims**

1. A process for producing catalysts which are used for the vapor-phase oxidation of olefinic hydrocarbons comprising impregnating a refractory carrier under substantially anhydrous conditions with a liquid oxytrihalide of vanadium selected from the group consisting of oxytrichloride and oxytribromide, removing the excess of said oxytrihalide of vanadium, hydrolyzing said oxytrihalide of vanadium and thereafter calcining the catalyst.

3,926,853
CATALYTIC OXIDATION OF AMMONIA

Michel Senes, Saint Nazaire; Pierre Lhonore, Douai; Michel Pottier, Saint Nazaire, and Jacques Quibel, Maisons Laffitte, all of France, assignors to Societe Chimique de la Grande Paroisse et Produits Chimiques, Paris, France

Division of Ser. No. 112,879, Feb. 5, 1971, abandoned. This application Mar. 28, 1973, Ser. No. 345,685
Claims priority, application France, Feb. 9, 1970, 70.04454
Int. Cl.² B01J *29/16, 29/12;* **C01B** *21/26*
U.S. Cl. 252—456 **8 Claims**

1. A stable catalytic composition for the catalytic oxidation of ammonia to nitrogen oxides, comprising:

a complex catalyst of limited porosity, containing no members of the platinum group, with a specific surface area of between 0.02 and 2 m^2/g,

said catalyst consisting essentially of metallic oxides consisting of iron oxide, vanadium oxide and at least one further metallic oxide selected from the group consisting of oxide of nickel, cobalt and bismuth, and a refractory material consisting of magnesia, silica, zirconia or a mixture thereof, all combined by mixing the powdered constituents, compressing at 1,000 – 10,000 bars and sintering at 1300°C or higher.

4. A stable catalytic composition for the catalytic oxidation of ammonia to nitrogen oxides, comprising:

a complex catalyst of limited porosity with a specific surface area between 0.02 and 2.0 m^2/g,

said catalyst consisting essentially of 0.1 to 10% of an active material selected from the group consisting of the metals of the platinum group, and a refractory oxide carrier comprising, in the composition, 10–60% MgO, 0.2–10% SiO_2, and 5–50% ZrO_2,

said active material being intimately combined in solid solution with said carrier by ceramic-type bonds formed by mixing said active material and said carrier, compressing at 1,000 to 10,000 bars pressure and sintering at a temperature of at least 1300°C.

3,926,854
OXIDATION CATALYST

James M. Whelan, La Canada, Calif., and Richard J. Brook, Didcot, England, assignors to University of Southern California, Los Angeles, Calif.

Filed Dec. 17, 1970, Ser. No. 99,239
Int. Cl.² B01J *23/10*
U.S. Cl. 252—462 **9 Claims**

1. A ceramic, nonstoichiometric, electrically neutral oxidation catalyst for treating exhaust gases from the combustion of fossil fuels, comprising a homogeneous mixed oxide compound having a unitary crystal structure and having the following empirical formula:

$$X_n J_{(1-n)} Z O_{(3+m)}$$

wherein:

X is an alkaline earth metal or mixture thereof;

J is scandium, yttrium, a rare earth element, or mixture thereof;

Z is titanium, vanadium, chromium, iron, cobalt, nickel, or a mixture thereof, at least 0.01% of Z having an oxidation state other than +3;

m is a number having a value between 0 and about 0.11, with the understanding that when m is 0 there is no readily measurable concentration of ionic defects in the compound and that when *m* is a value greater than 0 the compound is characterized by the presence of readily measurable ionic defects; and

n is a number other than 0 having a value up to about 0.51.

3,926,855
METHOD OF CATALYST MANUFACTURE

Kenneth D. Vesely, Arlington Heights, Ill., assignor to Universal Oil Products, Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 310,500, Nov. 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 124,575, March 15, 1971, abandoned. This application Jan. 21, 1974, Ser. No. 435,370
Int. Cl.² B01J *21/04*
U.S. Cl. 252—465 **6 Claims**

1. A method of manufacturing a catalytic composite of from about 1 to about 10 wt. % iron group metal oxide, from about 4 to about 30 wt. % Group VIB metal oxide, and alumina which comprises preparing a dry powdered blend of an alumina monohydrate, a compound of an iron group metal and a compound of a Group VIB metal, said compounds providing their respective oxides upon subsequent calcination in an oxidizing atmosphere, discharging the dry powdered blend in a continuous and uniform stream onto a rotating pelletizing disc and rolling the blend into spheroidal pellets in contact with from about a 5 to about a 15 wt. % aqueous solution of a strong mineral acid sprayed on said rotating disc, and drying the spheroidal pellets and calcining the same in an oxidizing atmosphere.

3,926,856
CATALYST FOR THE PRODUCTION OF AROMATIC HETERO-AROMATIC NITRILES AND PROCESS OF PREPARING THE CATALYST

Theodor Lussling; Hans Schaefer, both of Grossauheim, and Wolfgang Weigert, Offenbach, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Division of Ser. No. 74,829, Sept. 23, 1970, abandoned. This application June 22, 1973, Ser. No. 372,674
Claims priority, application Germany, Sept. 26, 1969, 1948715
Int. Cl.² B01J *23/16, 23/84*
U.S. Cl. 252—470 **15 Claims**

1. A process of preparing a catalyst, said process consisting essentially of heating with oxygen at 650° to 1100°C. (1)(a)

antimony oxide and (b) tungsten oxide, the atomic ratio of antimony to tungsten being from 1.1 to 1 up to 50 to 1 or (2)(a) antimony oxide (b) tungsten oxide and (c) an oxide of a member of the group consisting of manganese, chromium, iron, cobalt, nickel and copper wherein the atomic ratio of antimony to tungsten is from 1.1 to 1 up to 50 to 1, the atomic ratio of antimony to the total of manganese, chromium, iron, cobalt, nickel and copper does not exceed the atomic proportion of tungsten and the atomic ratio of antimony to the total of manganese chromium, iron, cobalt, nickel and copper is from 4 to 1 up to 20 to 1.

3,926,857
ELECTRICALLY CONDUCTING MATERIAL CONTAINING SILICON CARBIDE IN A MATRIX OF SILICON NITRIDE

Derek Ivan Matkin, Wantage; Ian William Cavell, Harewell, and John Raymond Dyson, Newbury, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 303,347, Nov. 3, 1972, abandoned. This application Dec. 13, 1974, Ser. No. 532,633

Claims priority, application United Kingdom, Nov. 8, 1971, 51878/71

Int. Cl.² H01B *1/02;* **H01C** *1/02*

U.S. Cl. 252—516 **3 Claims**

2. A method of producing a silicon nitride ceramic artefact having reduced electrical resistivity which comprises forming a mixture of carbon particles having a particle size of not greater than 50 microns and silicon particles and subjecting the mixture to nitriding conditions to nitride the silicon under which conditions the silicon and carbon react to form an electrically conductive interconnecting network silicon carbide phase in a matrix of silicon nitride, the relative proportions of silicon and carbon in the mixture and the conditions of nitriding being such that free silicon and free carbon are absent in the silicon nitride ceramic artefact, said silicon nitride artefact having an electrical resistivity not greater than 140 ohm-cm and having a silicon carbide content not greater than 37 percent by weight.

3,926,858
MOISTURE SENSITIVE ELEMENT

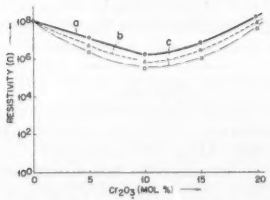
Noboru Ichinose, Yokohama; Yuhji Yokomizo, and Masaki Katsura, both of Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed July 11, 1974, Ser. No. 487,533

Claims priority, application Japan, July 13, 1973, 48-78476; July 13, 1973, 48-78477; Aug. 13, 1973, 48-78478; Sept. 20, 1973, 48-105455; Sept. 20, 1973, 48-105456

Int. Cl.² H01B *1/00*

U.S. Cl. 252—517 **8 Claims**



1. A moisture sensitive element formed of an oxide complex semiconductor comprising 89.9 to 20 mol% of ZnO, 0.1 to 20 mol% of Cr_2O_3 and 10 to 60 mol% of at least one of the third metal oxides selected from the group consisting of Li_2O, Na_2O, K_2O, Rb_2O, Cu_2O, BaO, SrO, CaO, PbO, MnO, NiO, CoO, MgO, CdO, CuO, FeO, BeO, TiO_2, GeO_2, ZrO_2, MnO_2, TeO_2, SnO_2, SiO_2, CeO_2, ThO_2, HfO_2, Nb_2O_5, Ta_2O_5, Sb_2O_5, V_2O_5, WO_3, MoO_3 and TeO_3.

3,926,859
SUBSTITUTED 2-[3'-METHYL-2'-BUTEN]YL-4-HEXENAL ODORANT COMPOSITIONS

Dietmar Lamparsky, Wangen-Dubendorf, and Jean-Pierre Calame, Fallanden, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

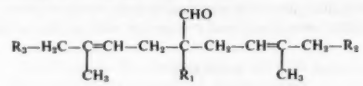
Division of Ser. No. 323,190, Jan. 12, 1973, abandoned. This application July 30, 1974, Ser. No. 493,002

Claims priority, application Switzerland, Jan. 21, 1972, 907/72

Int. Cl.² C11B *9/00;* **A61K** *7/00*

U.S. Cl. 252—522 **8 Claims**

1. An odorant composition which contains as an essential odour-imparting ingredient an olfactorily-effective amount of an aldehyde of the general formula:



(I)

wherein R_1, R_2 and R_3 each represent a hydrogen atom or a methyl group.

3,926,860
FRAGRANCE MATERIALS CONTAINING CIS-2-N-PENTYL CYCLOPROPANE-1-CARBOXYLIC ACID

Robert L. Chappell, Moorestown, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 436,846, Jan. 28, 1974, abandoned. This application Dec. 17, 1974, Ser. No. 533,637

Int. Cl.² A61K *7/46;* **C11B** *9/00;* **C07C** *61/04*

U.S. Cl. 252—522 **6 Claims**

6. An olfactory sense affecting composition of matter comprising (1) a product produced by a process comprising the steps of:

i. Treating cis-2-octen-1-ol with methylene diiodide in the presence of a copper-zinc couple to produce cis-2-n-pentylcyclopropane-1-methanol;

ii. Oxidizing said cis-2-n-pentylcyclopropane-1-methanol to form a mixture of cis and trans-2-n-pentylcyclopropane-1carboxaldehydes;

iii. Oxidizing said mixture of cis and trans-2-n-pentylcyclopropane-1-carboxaldehydes to form a mixture of cis and trans-n-pentylcycloproane-1-carboxylic acid; and

iv. Separating the cis and trans isomers of 2-n-pentylcyclopropane-1-carboxylic acid thereby obtaining a material having a high proportion of cis-2-n-pentylcyclopropane-1-carboxylic acid;

and (2) a composition of matter selected from the group consisting of natural perfume oils, synthetic perfume oils, alcohols, aldehydes, ketones, esters, lactones, a detergent, soap, bath preparation, hair preparation, cosmetic preparation or powder.

3,926,861
DETERGENT COMPOSITIONS CONTAINING AMINE OXIDES

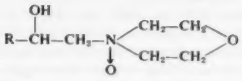
John Fred Gerecht, Somerville, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 166,253, July 26, 1971, Pat. No. 3,809,659, which is a division of Ser. No. 677,723, Oct. 24, 1967, Pat. No. 3,637,682. This application Nov. 9, 1973, Ser. No. 414,586The portion of the term of this patent subsequent to May 7, 1991, has been disclaimed.

Int. Cl.² C11D *3/28, 3/04*

U.S. Cl. 252—542 **8 Claims**

1. A detergent composition consisting essentially of a water-soluble organic detergent selected from the group consisting of anionic, nonionic, cationic and amphoteric detergents and mixtures thereof and a morpholine oxide of the formula



wherein R is alkyl of 6 to 20 carbon atoms, the weight ratio of said morpholine oxide to said other detergent being in the range of 100:1 to 1:100.

3,926,862

DETERGENT SOLVENT COMPOSITIONS

Francis J. Figiel, Boonton, and Roland W. Anderson, Sparta, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 16, 1973, Ser. No. 351,201

Int. Cl.² C11D *1/12, 3/43*

U.S. Cl. 252—545 **13 Claims**

1. A detergent solvent composition comprising from about 0.2 to about 91% by weight of composition of a detergent comprising a mixture of linear alkylbenzene sulfonic acid isopropylamine salts, the alkyl groups of which contain from 7 through 14 carbon atoms, a predominant amount of the alkyl groups in said linear alkylbenzene isopropylamine salts containing 11 through 12 carbon atoms, from about 19 to about 24 numerical percent of said linear alkylbenzene sulfonic acid isopropylamine salts having the benzene sulfonic acid group located on the two position of the linear alkyl group; and at least 9 percent by weight of said composition being essentially an organic cleaning solvent selected from the group consisting of Stoddard solvent; 1,1,2-trichloro-1,2,2-trifluoroethane; sym. or assym. tetrachlorodifluoroethane; trichloromonofluoromethane; and mixtures thereof.

3,926,863

METHOD FOR PRODUCING DETERGENT CAKES

Giulio Perla, Rome, and Giuseppe Mattiello, Nettuno, both of Italy, assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 204,297, Dec. 2, 1971, abandoned. This application July 9, 1973, Ser. No. 377,676

Claims priority application, Italy, Dec. 7, 1970, 55234/70

Int. Cl.² C11D *1/12, 11/04, 17/00*

U.S. Cl. 252—557 **5 Claims**

1. A process for the production of cleansing cakes comprising reacting approximately stoichrometric quantities of a butenedioic acid or anhydride and a compound having therein a reactive hydroxyl group and an acyclic chain at least predominately of 12 carbon atoms at a temperature between the melting point of said acid or anhydride and about 100°C to produce a monoalkyl ester of butenedioic acid, reacting stoichiometirc quantities of said monoalkyl ester with a sulfite chosen from the group consisting of alkali metal, ammonium and alkaline earth metal sulfites and bisulfites in the presence of from 5 to 60% by weight of a molten plasticizer chosen from the group consisting of fatty acid esters of polyhydric alcohols and paraffin wax and mixtures thereof and from about 15 to 20% by weight of water at a temperature from about 90°C to about 100°C to form a water-soluble monoalkylsulfosuccinate, cooling the resulting product, drying the resulting product, and forming the cooled product into cakes, said cakes including at least about 40% of said monoalkylsulfosuccinate by weight.

3,926,864

ION EXCHANGE MEMBRANES HAVING A MACROPOROUS SURFACE AREA

Russell B. Hodgdon, Jr., Sudbury, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Division of Ser. No. 155,357, June 21, 1971, Pat. No. 3,749,655. This application Feb. 20, 1973, Ser. No. 333,570

Int. Cl.² B01D *39/16*

U.S. Cl. 260—2.1 E **11 Claims**

1. A method of preparing a substantially insoluble cross-linked, polymeric non-laminated, one piece board suitable for the manufacture of ion-selective membranes, the boards having at least two dimensions in excess of one centimeter with both major surfaces having a macroporous structure of pore diameter sizes between about 500–1500 angstroms with the interior portion of said board substantially comprising a microporous structure having pore diameter sizes in the range of about 10–30 angstroms, the method comprising preparing a monomeric mixture of at least one monovinyl aromatic monomer and at least one polyvinyl aromatic cross-linking monomer, said cross-linking compound being present between about 20–80 mole % of the total polymerizable monomers of said mixture, said mixture further containing dissolved therein between about 15 to 75% by volume of an inert, non-polymerizable, organic solvent pair, said solvent pair comprising at least one good solvent and at least one poor solvent and polymerizing said monomeric mixture under conditions to substantially prevent the escape of said poor solvent from the monomer mixture during the formation of said polymerized board structure, said poor solvent being present in an amount of between about 15 to 55% by volume based on the total volume of said solvent pair.

3,926,865

PROCESS FOR POLYMERIZING LACTAMS IN THE PRESENCE OF AZODICARBOXYLATE AND ISOCYANATE

Norman Stewart Anderson, Blackley, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 357,652, May 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 229,458, Feb. 25, 1972, abandoned. This application Aug. 27, 1974, Ser. No. 500,883

Claims priority, application United Kingdom, May 4, 1971, 6026/71

Int. Cl.² C08J *9/00*

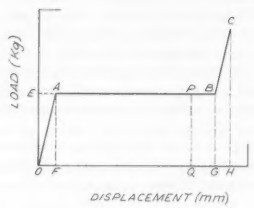
U.S. Cl. 260—2.5 N **9 Claims**

1. A process for the manufacture of a polyamide comprising forming a mixture of (1) a lactam having at least seven ring members which is associated with 0.01 to 0.5 percent by weight of water, (2) and alkali metal salt of azodicarboxylic acid, wherein the metal salt of azodicarboxylic acid is present in an amount at least equimolar with the amount of water present, and (3) an isocyanate or blocked isocyanate which, together with a portion of said alkali metal salt of azodicarboxylic acid, constitutes a catalyst species, and polymerizing said lactam under anoinic polymerization conditions, whereby said metal salt of azodicarboxylic acid enables polymerization to take place even though said lactam is initially associated with a considerable amount of water.

3,926,866
PROCESS FOR PRODUCTION OF RIGID POLYURETHANE FOAM AND PRODUCT FOR USE AS ENERGY ABSORBING MATERIAL

Noboru Komatsu, Toyoakeshi; Toshio Kurauchi, Nagoya; Makoto Murase, Nagoya, and Kazuhiko Negi, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan

Filed June 6, 1974, Ser. No. 477,111
Claims priority, application Japan, June 6, 1973, 48-63546
Int. Cl.[2] C08G *18/14*
U.S. Cl. 260—2.5 AH **7 Claims**



1. A process for producing a rigid polyurethane foam for absorbing maximum kinetic energy in a collision with a human body without injury to same, comprising mixing a polyol for rigid foam as a resin, an isocyanate as a cross-linking agent, a chlorofluorocarbon as a blowing agent, a catalyst for promoting the reaction of said polyol with said isocyanate, a bubble-stabilizing agent for aiding in uniform bubble formation, and an additive comprising a diorganosilicone oil and silica in a ratio ranging from 1.1 to 1.2, said diorganosilicone oil including a member selected from the group consisting of substituted and unsubstituted hydrocarbon groups, said additive being used in an amount from 0.003 – 0.02 parts by weight per 100 parts by weight of said polyol and foaming the resultant mixture to produce rigid polyurethane foam having closed cells with a cell diameter ranging from 3 mm to 13 mm.

3,926,867
HIGH RESILIENCY FLEXIBLE URETHANE FOAMS

Billy Quock, Richwood; Don Howard Kelley, Lake Jackson; Sehon Lester Warneke, Brazoria, and Arthur E. Gurgiolo, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 410,135, Oct. 26, 1973, abandoned. This application Mar. 4, 1974, Ser. No. 448,164
Int. Cl.[2] C08G *18/14, 18/32*
U.S. Cl. 260—2.5 AM **9 Claims**

1. A flexible polyurethane foam having a resiliency greater than about 50%, a modulus of at least about 2.3 and a density of less than about 5 lbs/ft^3 resulting from subjecting to foaming conditions, a composition which comprises

A. 1. from about 50 to 100 percent by weight of a polyether triol having an average hydroxyl equivalent weight of from about 900 to about 2500, said triol having been end-capped with at least 1 mole of ethylene oxide per hydroxyl group to provide the triol with primary hydroxyl groups,

2. from 0 to about 50 percent by weight of a polyol selected from a diol, a triol, or mixtures thereof wherein said diols and and triols have an average hydroxyl equivalent weight of from about 900 to about 2500;

B. an organic polyisocyanate consisting of

1. from about 50% to 100% by weight of 2,4-toluene diisocyanate, 2,6-toluene diisocyanate, NCO-containing prepolymers thereof, or mixtures thereof, and

2. from 0 to about 50% by weight of an organic polyisocyanate having an average NCO functionality of at least 2;

C. from about 1.0 to about 5 parts by weight of water per 100 parts by weight of component (A);

D. from about 0 to about 20 parts of a low boiling auxiliary blowing agent per 100 parts by weight of component (A);

E. from about 0.6 to about 10 parts per 100 parts by weight of component (A) of a crosslinker composition consisting essentially of

1. from 5 to 100 percent by weight of a primary crosslinker component selected from the group consisting of 1-amino-2-hydroxybutane; 2-amino-1-hydroxybutane; 2-amino-1-hydroxy-2-methylpropane; bis(2-hydroxybutyl)amine; tris(2-hydroxybutyl)amine; 3-phenoxy-2-hydroxypropyl amine; 2-phenyl-2-hydroxyethylamine; 3-phenoxy-2-hydroxypropyl-N-phenylamine; 2-hydroxybutyl-N-phenylamine; bis(3-phenoxy-2-hydroxypropyl)amine; 2-hydroxyethyl-N-(3-phenoxy-2-hydroxypropyl)amine; 1-amino-2-hydroxycyclopentane; 1-amino-2-hydroxycyclooctane; 2-hydroxyethyl-N-(2-hydroxybutyl)amine, and mixtures thereof; and

2. from 0 to about 95 percent by weight of an auxiliary crosslinker component;

F. from about 0.5 to about 4 parts by weight per 100 parts by weight of Component (A) of a catalyst for the urethane reaction;

G. from about 0.005 to about 2.5 parts by weight per 100 parts by weight of Component (A) of a silicone oil cell control agent;

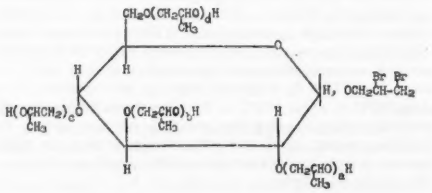
and wherein Components (A), (B), (C) and (E) are present in quantities so as to provide an NCO:active hydrogen ratio of from about 0.8:1.0 to about 1.3:1.0.

3,926,868
FLAME-RETARDANT POLYURETHANE FOAMS

Felix H. Otey; Richard P. Westhoff, and Charles L. Mehltretter, all of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 161,312, July 9, 1971, Pat. No. 3,823,132. This application Jan. 16, 1974, Ser. No. 433,647
Int. Cl.[2] C08G *18/14, 18/50*
U.S. Cl. 260—2.5 AS **1 Claim**

1. A flame-retardant polyurethane foam comprising the reaction product of an organic polyisocyanate, a blowing agent, a catalyst, and a brominated propoxylated allyl glucoside composition comprising a mixture of from 70 to 90 percent of a compound having the following general structure:



where *a*, *b*, *c*, and *d* are any integer including zero and $a + b + c + d$ = from 4 to 8; and from 10 to 30 percent dimers and oligosaccharides which differ from said compound only in that said dimers and oligosaccharides consist of a plurality of anhydroglucose units connected through hemiacetal linkages; said composition being characterized as having hydroxyl numbers of from 260 to 380, as being a liquid, and as containing from 19 to 26 percent bromine.

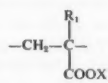
3,926,869

PROCESS FOR HARDENING GELATIN IN PHOTOGRAPHIC LAYERS WHICH CONTAIN A THICKENER AND HARDENER BY UTILIZING ACRYLIC ACID-ACRYLAMIDE COPOLYMERS

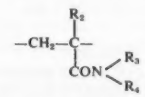
Ikutaro Horie; Takashi Miyazako, and Takeo Shimada, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 7, 1974, Ser. No. 477,236
Claims priority, application Japan, June 7, 1973, 48-64041
Int. Cl.² C08L *89/00*
U.S. Cl. 260—8 **8 Claims**

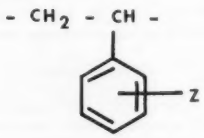
1. A process for hardening gelatin which comprises incorporating an acrylic acid-acrylamide copolymer into the system containing gelatin, a thickener and a hardener; said acrylic acid-acrylamide copolymer being a copolymer containing about 5 to 95 mol % of the following repeating unit (A):



and about 5 to 95 mol % of the following repeating unit (B)



wherein R_1 and R_2 are each a hydrogen atom or a methyl group, R_3 and R_4 are each a hydrogen atom or an alkyl group having from 1 to 6 carbon atoms, or wherein R_3 and R_4 can combine to form a non-metal atom containing 5-, 6- or 7-membered ring, and X is a hydrogen atom, a sodium atom, a potassium atom, a lithium atom, or an ammonium group, said acrylic acid-acrylamide copolymer being present in said system at about 0.001 to about 0.1 parts by weight per part by weight of gelatin, and having a limiting viscosity ranging from about 0.3 to about 6.0 measured at 30°C using a 1 % by weight aqueous solution of sodium chloride; and said thickener being a high molecular weight polymer comprising the following repeating unit:



wherein Z is a sulfonic acid group or a sulfonic acid salt group, said thickener being capable of increasing the viscosity of a gelatin solution to about 30 to about 100 centipoises at about 40°C.

3,926,870

DENTURE ADHESIVE PREPARATION CONTAINING AN ANIONIC PROTEIN MATERIAL

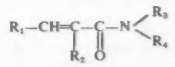
James J. Keegan, Bloomfield; Girish Patel, Mine Hill, and Howard Rubin, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 406,529, Oct. 15, 1973, Pat. No. 3,878,135. This application Jan. 15, 1975, Ser. No. 541,304
Int. Cl.² A61K *31/785*; **C08L** *89/00*
U.S. Cl. 260—8 **16 Claims**

1. A denture adhesive comprising a dry mixture of:

A. from about 1.0% to about 80% by weight, based on the total weight of the denture adhesive, of at least one cationic polymeric material selected from the group consisting of:

1. a copolymer of an acrylamide having the Formula (I)



(I)

wherein R_1 is methyl or hydrogen; and R_2, R_3, and R_4 are each hydrogen or 1 to 7 carbon lower alkyl, with a vinyl quaternary ammonium salt selected from the group consisting of trialkylaminoalkyl acrylate salts, trialkylaminoalkyl methacrylate salts, and vinyloxyalkyltrialkylammonium salts, wherein the alkyl group contains from 1 to 7 carbon atoms; and

2. a copolymer of an acrylamide having the Formula (I) above with a vinyl or alkyl-substituted vinyl pyridinium salt, wherein the alkyl group is 1 to 7 carbon lower alkyl; and

B. from about 10% to about 90% by weight, based on the total weight of the denture adhesive, of at least one anionic protein material which is casein or its alkali metal salts.

3,926,871

POLYMERIZATES OF OLEFINIC NITRILES

Linda W. Hensley, Bainbridge Township, Geauga County, and George S. Li, Aurora, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

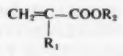
Filed Nov. 20, 1974, Ser. No. 525,377
Int. Cl.² C08F *244/00*
U.S. Cl. 260—80.72 **4 Claims**

1. The terpolymer composition resulting from the copolymerization of

A. from about 60 to 90% by weight of at least one nitrile having the structure

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,

B. from about 10 to 39% by weight of an ester having the structure



wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms, and

C. from about 1 to 15% by weight of at least one member selected from the group consisting of indene and coumarone

wherein the given percentages of (A), (B), and (C) are based on the combined weight of (A), (B), and (C).

3,926,872
FLAME-RETARDANT CELLULOSICS CONTAINING GRAFT COPOLYMERIZED ACRYLIC ESTERS OR AMIDES

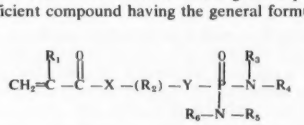
Nathan Allen Edelson, Cynwyd, and Robert W. Faessinger, Media, both of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 325,101, Jan. 19, 1973, abandoned. This application Sept. 23, 1974, Ser. No. 508,724

Int. Cl.² C08L *1/02*; **D06M** *13/44*

U.S. Cl. 260—17.4 GC **4 Claims**

1. Flame retardant cellulosic fibers graft copolymerized with sufficient compound having the general formula:



wherein R_1 is hydrogen or methyl; R_2 is a substituted or unsubstituted lower alkylene group, R_3, R_4, R_5 and R_6 are independently selected from either methyl and ethyl; X is oxygen or — NH —; and Y is oxygen or — NH — to result in at least 0.5% phophorus content on the graft copolymerized cellulosic fibers based upon the total weight of the graft copolymerized fibers.

3,926,873
THERMOPLASTIC MATERIAL COMPOSITIONS

Itsuho Aishima, Kurashiki; Atsushi Kitaoka, Kawashaki; Toshinori Koseki, Tokyo; Sachio Suzuki, Yokohama; Kenji Arimoto, and Koichi Matsumoto, both of Kurashiki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 18, 1972, Ser. No. 316,314

Claims priority, application Japan, Dec. 20, 1971, 46-102598; Dec. 20, 1971, 46-102600; Dec. 20, 1971, 46-102602; Apr. 18, 1972, 47-38287; Dec. 20, 1971, 46-102599; Dec. 20, 1971, 46-102601; Apr. 5, 1972, 47-33442; Oct. 16, 1972, 47-102635

Int. Cl.² C08K *9/04*; **C08L** *91/00*

U.S. Cl. 260—18 R **37 Claims**

1. A thermoplastic material composition comprising (A) about 15 to 90 percent by weight of thermoplastic material and (B) about 85 to 10 percent by weight of at least one reactive inorganic filler,

said reactive filler having been prepared by effecting reaction between a mixture consisting essentially of

a. an inorganic material substantially comprising at least one compound selected from the group consisting of metal carbonates, metal hydroxides and metal oxides, said metal being selected from the group consisting of beryllium, magnesium, calcium, barium, zinc, cadmium and aluminum, said compound having a number average particle diameter of about 10 μ, and

b. at least one unsaturated aliphatic or aromatic carboxylic acid having from 3 to 11 carbon atoms, one or two ethylenic unsaturations, and one or two carboxylic groups the proportion of said unsaturated aliphatic or aromatic carboxylic acid being from about 0.05 to 20 percent by weight of the total weight of said inorganic material,

with stirring and removal of water from the reaction system at a temperature up to the temperature at which said aliphatic or aromatic carboxylic acid begins to decompose.

3,926,874
WATER REDUCIBLE PAINT COMPOSITION CONTAINING ALUMINUM METAL OR THE LIKE

John Lee Petty, and George Minoru Amano, both of Detroit, Mich., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Mar. 25, 1974, Ser. No. 454,582

Int. Cl.² C09D *3/52, 3/56, 3/66, 3/76*

U.S. Cl. 260—22 A **16 Claims**

1. A water based coating composition which is stabilized to include water reactive metallic pigment, comprising in weight percent.

a. about 0.1% to about 80% of a particulated reactive metallic pigment selected from at least one of the group consisting of aluminum, zinc, bronze, or reactive titanium containing pigments,

b. about 3% to about 40%, by weight of the metallic pigment, of a modifying agent means for preferentially wetting the metallic pigment so that it does not react with aqueous material in the composition, said modifying agent being water insoluble, non-ionizable, and having a surface tension of at least about 4 dynes per centimeter less than the aqueous phase of the composition, said modifying agent being selected from at least one of the group consisting of a polyamide, fatty amide, a fluorochemical surfactant, or a silicone surfactant, and said aqueous phase being as follows,

c. about 10% to about 75%, based on resin solids, of water reducible resin vehicle,

d. zero to about 45% solvent material for dissolving the resin vehicle,

e. and balance water.

3,926,875
THERMOSETTING POLYMER DISPERSIONS AND PROCESS FOR PRODUCTION THEREOF

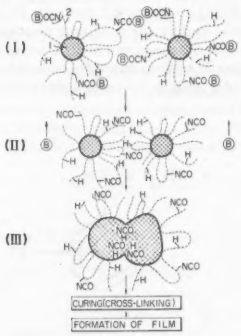
Hideyoshi Tsugukuni, Sakai; Masafumi Kano, Kyoto, and Mitsuhiro Matsuda, Tondabayashi, all of Japan, assignors to Dai Nippon Toryo Co. Ltd., Osaka, Japan

Filed June 28, 1973, Ser. No. 374,656

Claims priority, application Japan, July 3, 1972, 47-66432

Int. Cl.² C08G *18/80*

U.S. Cl. 260—23 TN **17 Claims**



1. A thermosetting synthetic polymer dispersion comprising a non-polar organic liquid or an organic liquid having a low polarity as a disperion medium and particles of a copolymer

formed by copolymerization of copolymerizable unsaturated monomers, said copolymer particles having around the periphery thereof a protective layer of an unsaturated fatty acid-containing oil modified resin having a molecular weight of about 500 to 10,000 an acid value of less than 75 and an hydroxy value of at least 10 (a) having a component compatible with said copolymer or being chemically bonded to said copolymer and (b) being solvated in said organic liquid and containing blocked isocyanate and active hydrogen groups, and formed by reacting a partially blocked isocyanate compound having a free isocyanate group and a blocked isocyanate group with an active hydrogen-containing, polymer compound wherein the sum of the number of the free and blocked isocyanate groups in one molecule of the partially blocked isocyanate compound and the number of the active hydrogen groups in one molecule of the active hydrogen-containing, polymer compound is at least five, and they are reacted at such a ratio that the amount of the active hydrogen groups of the active hydrogen-containing, polymer compound is at least equivalent to the amount of the free isocyanate groups of the partially blocked isocyanate compound; the ratio of the active hydrogen groups in the active hydrogen group-containing, polymer compound to the free isocyanate groups in the partially blocked isocyanate compound being 1.0 to 3, and the ratio of the active hydrogen groups in the active hydrogen-containing, polymer compound to the sum of the free and blocked isocyanate groups in the partially blocked isocyanate compound being 0.5 to 1.5; and the amount of stabilizer being from 30 to 80% by weight of the total dispersed solids, said copolymer being made in the form of particles of a size 0.1 to 10μ stably dispersed in said organic liquid by said protective layer.

3,926,876
FLAME-RESISTANT RESINOUS MOLDING

Mitio Fukushima, Suita, and Teruo Iwanami, Takatsuki, both of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 21, 1974, Ser. No. 481,901
Int. Cl.[2] C18L *91/00*
U.S. Cl. 260—23 R **5 Claims**

1. A flame-resistant resinous molding composition comprising

a. ethylene-vinyl alcohol copolymer,

b. 5 to 50 parts of at least one halo-organocompound selected from the group consisting of hexabromobenzene, perchloropentacyclodecane and derivatives thereof, tetrabromobisphenol A, tetrachlorobisphenol A, tetrabromophthalic anhydride, tetrachlorophthalic anhydride and di(tetrabromophenyl)imide,

c. 0.2 to 10 parts of a metallic soap, and

d. 0 to 30 parts of antimony trioxide, said parts of (b), (c) and (d) being parts by weight per 100 parts of (a).

3,926,877
PROCESS FOR ISOLATING POLYCHLOROPRENE

Sidney George Fogg, Ashstead, England; Peter Graham King, Peterston Super Ely, and Elfed Yeoman, Barry, both of Wales, assignors to BP Chemicals International Limited, London, England

Filed Nov. 23, 1973, Ser. No. 418,385
Claims priority, application United Kingdom, Dec. 6, 1972, 56236/72
Int. Cl.[2] C08J *3/20*; **C08L** *11/02*, *91/00*
U.S. Cl. 260—23.7 A **10 Claims**

1. A process for the isolation of a polychloroprene rubber from an aqueous latex which comprises blending the latex of the polychloroprene rubber with an aqueous dispersion of from about 20–400 parts of carbon black to 100 parts of said rubber, mixing a coagulant with the mixture, treating the coagulated rubber particles with a water dispersible finely divided solid having anti-tack properties and a particle size less than 100μ either during and/or after coagulation, when treating said rubber particles during coagulation any surfactant present with said antitack solid is effective at a pH of 4–5 and when treating said rubber particles after coagulation substantially preventing agglomeration of said rubber particles so that they do not form particles above about 30mm diameter, and separating the coagulated product from the aqueous phase.

3,926,878
HOT-MELT COMPOSITIONS COMPRISING E/VA COPOLYMER AND HYDROGENATED PETROLEUM RESIN

Katsuhisa Shimizu, Kyoto, and Norio Minami, Kawachinagano, both of Japan, assignors to Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 16, 1973, Ser. No. 324,224
Claims priority, application Japan, Jan. 24, 1972, 47-9187
Int. Cl.[2] C08L *23/08*
U.S. Cl. 260—27 EV **6 Claims**

1. A hot-melt composition comprising 10 to 100 weight parts of a hydrogenated aromatic petroleum resin and 100 weight parts of an ethylene-unsaturated ester copolymer, said hydrogenated aromatic petroleum resin being prepared by polymerizing a cracked petroleum fraction boiling between −10° and 280°C and containing unsaturated hydrocarbons at least 50 percent by weight of which is polymerizable aromatic hydrocarbon and hydrogenating the resulting aromatic hydrocarbon resin to a hydrogenation degree of aromatic ring of 5 to 80 percent, and said ethylene-unsaturated ester copolymer being ethylene-unsaturated ester copolymer containing 60 to 90 weight percent of ethylene, said unsaturated ester being a member selected from the group consisting of vinyl acetate, methylacrylate and ethylacrylate.

3,926,879
AQUEOUS SEALANT COMPOSITIONS

Walter A. Fourier, Crystal Lake, Ill., and Daniel J. Dickmann, Appleton, Wis., assignors to M&T Chemicals Inc., Greenwich, Conn.

Filed Apr. 1, 1974, Ser. No. 456,604
Int. Cl.[2] C08L *93/00*
U.S. Cl. 260—27 R **6 Claims**

1. In an improved sealant composition for metal containers, said composition consisting essentially of an aqueous dispersion comprising 100 parts by weight of a dispersed elastomeric polymer selected from the group consisting of natural rubbers and synthetic rubbers; between 30 and 75 parts of a tackifying resin; between 5 and 20 parts of a thickener; and between 30 and 100 parts of a filler selected from the group consisting of hydrated alumina, silica, and zinc oxide, wherein the concentration of dissolved and dispersed solids in the sealant composition constitutes between 35 and 70 percent by weight of said composition, the improvement which resides in selecting the thickener from the group consisting of copolymers wherein between 25 and 60 percent by weight of the repeating units are derived from the ammonium salt of acrylic or methacrylic acid, any remaining repeating units being derived from esters of acrylic acid or methacrylic acid with alcohols containing between 1 and 20 carbon atoms.

3,926,880

LATEX-RESIN MIXTURES

Heinz Esser, Burscheid, and Jürgen Boldt, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 294,954, Oct. 4, 1972, abandoned. This application June 24, 1974, Ser. No. 482,349

Claims priority, application Germany, Oct. 7, 1971, 2149999

Int. Cl.² C08L *93/00*

U.S. Cl. 260—27 BB 3 Claims

1. A process for producing a stable aqueous dispersion which comprises mixing (1) a preformed aqueous dispersion of a chloroprene polymer which is a homopolymer thereof or a copolymer of chloroprene with up to 20 percent by weight, based on chloroprene, of 2,3-dichlorobutadiene-(1,3), acrylonitrile, methacrylic acid, acrylic acid or an ester or hydroxy ester of acrylic acid or methacrylic acid with a polyhydric alcohol and (2) a solution of a natural or synthetic resin which improves the adhesive power of adhesive mixtures, in chloroprene or a mixture of said monomers of said chloroprene copolymer, there being from 5 to 30 percent by weight of said natural or synthetic resin in resulting mixture based on said chloroprene polymer, and subsequently removing the chloroprene monomer or said mixture of monomers from said mixture of (1) and (2) to obtain said stable aqueous dispersion.

3,926,881

FLEXIBLE POLYVINYL CHLORIDE PLASTICS HAVING IMPROVED FLAME RETARDANCY AND REDUCED SMOKE GENERATING

John J. Kracklauer, Boulder, Colo., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed May 6, 1974, Ser. No. 467,534

Int. Cl.² C08L *91/00*

U.S. Cl. 260—28.5 D 11 Claims

1. A flexible polyvinyl chloride plastic having improved flame retardancy and smoke suppression properties, containing in chemically uncombined form, per 100 parts, by wt., of polyvinyl chloride resin, about from 5 to 30 parts of a chlorinated paraffin having a chlorine content of from 35 to 75%, by wt., and a viscosity, at 20°C, of about from 1 to 200 poise; and about from 0.01 to 1 part, by wt., of a dicyclopentadienyl iron derivative having a molecular weight of at least 360.

3,926,882

ALPHA-METHYL STYRENE/TERTIARY BUTYL STYRENE/OLEFIN TEREPOLYMER RESINS AND HOT MELT ADHESIVES CONTAINING THE SAME

Michael G. Henk, Wheaton, and Gary P. Sartler, Downers Grove, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Division of Ser. No. 418,563, Nov. 23, 1973. This application Aug. 12, 1974, Ser. No. 496,867

Int. Cl.² C08L *91/06*

U.S. Cl. 260—28.5 AV 10 Claims

1. A composition comprising a terpolymer consisting of:

a. one part by weight tertiary-butylstyrene;

b. from 1 to 10 parts by weight alpha-methylstyrene; and

c. from 0.005 to 0.5 parts by weight of olefin having a ring and ball softening point of 200° to 350°F. and, per 100 parts by weight of said terpolymer, 10 to 1200 parts of an ethylenevinyl acetate copolymer having a vinyl acetate content within the range of 15 to 40 weight percent, and 10 to 1800 parts of a paraffin wax having a melting point of 125° to 200°F.

3,926,883

FLAME RETARDANT COMPOSITIONS

Irving Touval, Edison, N.J., assignor to M&T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 68,538, Aug. 31, 1970, abandoned. This application Sept. 11, 1974, Ser. No. 504,863

Int. Cl.² C08K *3/20, 3/24, 5/02*

U.S. Cl. 260—28.5 A 9 Claims

1. A polymer composition exhibiting enhanced flame retardancy, wherein the polymer is selected from the group consisting of polyvinyl chloride, polyvinylidene chloride and copolymers of vinyl chloride and vinylidene chloride with one another and with ethylenically unsaturated monomers, wherein said polymer composition contains between 0.5 and 10 parts by weight per 100 parts of said polymer of a flame retardant containing 20 percent by weight of hydrated stannic oxide and 80 percent by weight of a second component selected from the group consisting of colemanite, zinc oxide and mixtures of zinc oxide and magnesium oxide.

3,926,884

ABS RESIN COMPOUNDS

John M. McColgan, 1623 Roscomare Road, Los Angeles, Calif. 90024

Filed Oct. 18, 1974, Ser. No. 515,860

Int. Cl.² C08L *91/00*

U.S. Cl. 260—28.5 AS 8 Claims

1. An extended ABS type resinous plastic composition comprising:

polymerized acrylonitrile, butadiene and styrene constituting together at least about 50 percent of the composition by weight; and

a material intimately mixed with said polymerized acrylonitrile, butadiene and styrene and selected from the group consisting of air blown asphalt, gilsonite, and mixtures thereof, and constituting not more than about 20 percent of the composition by weight.

3,926,885

SILOXANE-MODIFIED EPOXY RESIN COMPOSITIONS

Joseph W. Keil, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 23, 1974, Ser. No. 535,623

Int. Cl.² C08L *63/00*

U.S. Cl. 260—29.1 SB 13 Claims

1. A homogeneous polymeric dispersion comprising

a. 55 to 95 weight percent of a curable epoxy resin composition;

b. 4 to 35 weight percent of a fluid lubricant which is incompatible with the epoxy resin composition, said fluid having a viscosity in the range of 20 to 20,000,000 cs. at 25°C.;

c. 1 to 10 parts weight percent of a dispersing agent capable of maintaining (b) dispersed in (a), said dispersing agent being a siloxane copolymer selected from the group consisting of

1. polydimethylsiloxane-organic copolymers in which the polydimethylsiloxane portion has a molecular weight of at least 1,500 and the organic portion consists essentially of a polyoxyethylene polymer, a polyoxypropylene polymer, or a polyoxyethylene-polyoxypropylene copolymer said organic portion having a molecular weight of at least 500 and said organic portion being attached to silicon atoms via silicon-carbon bonds, and

2. polydimethylsiloxane-organic copolymers which are reaction products produced by heating a mixture of a polydimethylsiloxane containing silicon bonded hydrogen atoms having a molecular weight of at least 1500, and a hydroxylated polyoxyethylene polymer, a hydroxylated polyoxypropylene polymer, or a hydroxylated polyoxyethylene-polyoxypropylene copolymer, said hydroxylated polyoxyalkylene polymer having a molecular weight of at least 500.

3,926,886

EPOXY RESIN-AMINE SALT EMULSION COMPOSITION

John Joseph Kelley, Willingboro, N.J., and Alan Edward Varker, Philadelphia, Pa., assignors to ESB Incorporated, Philadelphia, Pa.

Filed Mar. 27, 1974, Ser. No. 455,070
Int. Cl.² C08G 51/24
U.S. Cl. 260—29.2 EP 7 Claims

1. An epoxy resin-amine salt in water emulsion composition essentially of water, a liquid epoxy resin comprising a condensation product of epichlorohydrin with a polyhydric alcohol or phenol and an amine salt reaction product obtained by reacting a carboxylic acid selected from formic acid and acetic acid with a liquid aliphatic ether diamine having the formula

$$R_1-O-R_2-NH-R_3-NH_2$$

wherein R_1 is a branched or linear higher alkyl radical having at least 8 carbon atoms, and R_2 and R_3 are linear lower alkylene radicals having from 2 to 4 carbon atoms, with the amine salt present in an amount sufficient to react with about 40–80percent of the reactive epoxy groups present in the liquid epoxy resin.

3,926,887

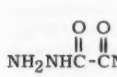
PROCESS FOR PREPARING SPINNING SOLUTIONS

Frank Dobinson, Gulf Breeze, and Chris A. Pelezo, Pensacola, both of Fla., assignors to Monsanto Company, St. Louis, Mo.

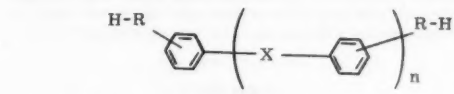
Division of Ser. No. 363,456, May 24, 1973, Pat. No. 3,842,026, which is a continuation-in-part of Ser. No. 273,069, July 19, 1972, abandoned. This application June 17, 1974, Ser. No. 480,089
Int. Cl.² C08J 3/06; C08K 5/20, 5/34; C08L 79/06
U.S. Cl. 260—29.2 N 8 Claims

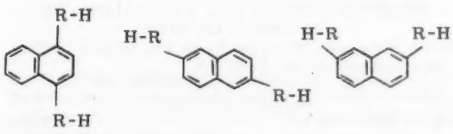
1. A process for preparing a polymer spinning solution comprising:

a. forming a polymer gel by reacting and mixing substantially equimolar amounts of (1) terephthaloyl chloride and terephthalic dihydrazide or (2) terephthaloyl chloride and a mixture of terephthalic dihydrazide and up to 10 mole percent of the terephthalic dihydrazide reactant of at least one other monomer at a temperature between −15°C. and 100°C. and in the presence of a solvent for said polymer, said mixing is sufficient to keep said polymer in solution with said solvent until said gel is formed, wherein said other monomer is selected from the group consisting of

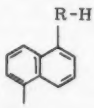


;



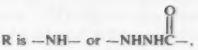


and

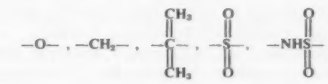


;

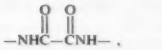
wherein the bonds of each phenylene ring are meta or para oriented to one another, R is



n is zero or one and X is a covalent bond or a divalent radical selected from the group consisting of



and



wherein said solvent contains from 2 to 7% by weight of lithium chloride dissolved therein and is selected from the group consisting of N,N-dimethylacetamide, N-methylpyrrolidone-2 and mixtures thereof;

b. adding a small amount of water or organic hydroxyl compound selected from the group consisting of methyl alcohol, ethyl alcohol, isopropyl alcohol and ethylene glycol to said gel; and

c. further mixing of said gel until a clear polymer solution is obtained;

said process being characterized in that sufficient amounts of reactants are employed to provide a polymer spinning solution having a viscosity between 1,000 and 40,000 poise and containing at least 3.0 percent by weight of polymer having an inherent viscosity of at least 3.0.

3,926,888

METHOD OF MAKING AQUEOUS COATING COMPOSITIONS OF ACRYLIC POLYMER LATEX, ACRYLIC POLYMER SOLUTION, AMINOPLAST AND ACRYLIC STABILIZER POLYMER

Mo-Fung Cheung, Warren, and Ray A. Dickie, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 3, 1974, Ser. No. 476,115
Int. Cl.² C08L 29/02, 33/02, 61/24, 61/28
U.S. Cl. 260—29.4 UA 2 Claims

1. In a method for producing an aqueous dispersion of paint in which a carboxy-functional polymer is at least partially neutralized with a water-soluble amine and dispersed with an amino resin crosslinking agent selected from melamine-formaldehyde resins and urea-formaldehyde resins in an aqueous solution of water and water-soluble amine, the improvement wherein the aqueous dispersion is produced by intimately dispersing with said water, said amino resin cross-linking agent and said water-soluble amine:

I. about 5 to about 50 parts by weight of a solution polymer which is carboxy-functional copolymer of acrylic monomers that:

A. is at least partially neutralized with water-soluble amine,

B. is soluble in said aqueous solution,

C. has average molecular weight (M_n) in the range of about 3,000 to about 20,000, and

D. has Tg in the range of −15°C. to 50°C., and

II. an aqueous emulsion consisting essentially of water, water-soluble amine, and about 50 to about 95 parts by weight of an emulsion polymer having functionality selected from carboxy functionality and hydroxy functionality and is a copolymer of acrylic monomers that:

A. is essentially insoluble in said aqueous solution,

B. has average molecular weight (M_n) in the range of about 3,000 to about 20,000, and

C. has Tg in the range of −15°C. to 50°C., and

III. about 0.025 to about 5 parts by weight of a stabilizer polymer which is a carboxy-functional copolymer of

acrylic monomers that is soluble in said aqueous solution, has average molecular weight ($\overline{M}_n$) lower than that of said solution polymer and is introduced into said dispersion intimately mixed with at least one of said solution polymer and said emulsion polymer.

3,926,889
PREPARATION OF PLASTICIZED LATEXES USING HIGH-DENSITY VIBRATIONAL ENERGY

Eugene A. Duchesneau, Jr., and Donald F. Boudreau, both of Worcester, Mass., assignors to Borden, Inc., Columbus, Ohio

Continuation of Ser. No. 153,005, June 14, 1971, abandoned. This application Mar. 1, 1973, Ser. No. 337,068

Int. Cl.² C08J *3/28;* **C08K** *5/12;* **C08F** *214/06, 218/08*

U.S. Cl. 260—29.6 PM **8 Claims**

1. A method for plasticizing solid polyvinyl chloride particles contained in a polymeric latex material comprising treating a mixture of plasticizer and solid polyvinyl chloride particles contained in the polymer latex, the latex polymer particles of which have an average diameter of 0.01 micron to 1.00 micron and the mixture has a solids content of from 45 to 67% by weight, with ultrasonic energy having a frequency of at least about 15,000 cycles per second.

3,926,890
PROCESS FOR PRODUCING CATIONIC SYNTHETIC LATEX INVOLVING EMULSION POLYMERIZATION OF HALOALKYL ESTERS OF ACRYLIC AND METHACRYLIC ACID FOLLOWED BY QUARTERNIZATION WITH TERTIARY AMINE

Ching Yun Huang, Minoo; Senzo Shimizu, Suita, and Hiroyuki Adachi, Amagasaki, all of Japan, assignors to Mitsubhishi Gas Chemical company, Inc., Tokyo, Japan

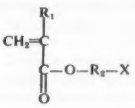
Continuation-in-part of Ser. No. 143,654, May 14, 1971, abandoned. This application Dec. 4, 1972, Ser. No. 311,478

Int. Cl.² C08F *22/18*

U.S. Cl. 260—29.6 H **13 Claims**

1. A process for producing a cationic synthetic latex, wherein copolymer particles have cationic charges in themselves and are dispersed in an aqueous medium, which comprises:

1. copolymerizing by emulsion polymerization a haloalkyl ester of acrylic or methacrylic acid of the formula:



1. wherein R_1 is a hydrogen atom or a methyl group; R_2 represents a linear or branched alkylene group having 1 to 12 carbon atoms; and X represents a chlorine, bromine or iodine atom, with at least one comonomer selected from the group consisting of styrene, alkyl esters of acrylic or methacrylic acid, vinyl chloride, vinylidene chloride and conjugated diene compounds, the amount of said haloalkyl ester being 1 to 40 percent by weight and the amount of said comonomer being 60 to 99 percent by weight based on the entire amount of the monomeric composition, in the presence of at least one emulsifier selected from the group consisting of nonionic and cationic surface active agents by use of a conventional emulsion polymerization initiator at a temperature of −5° to 100°C, and then

2. adding to the aqueous dispersion of said copolymer at least one basic nitrogen-containing compound selected from the group consisting of ammonia, primary amines, secondary amines and tertiary amines to form an ammonium salt of said copolymer, said basic nitrogen-containing compound being used in such an amount that the cation-formation ratio based on the amount of the haloalkyl ester of acrylic or methacrylic acid becomes at least 75 percent.

3,926,891
METHOD FOR MAKING A CROSSLINKABLE AQUEOUS SOLUTION WHICH IS USEFUL TO FORM SOFT, WATER-SWELLABLE POLYACRYLATE ARTICLES

James R. Gross, Lake Jackson, and Russell T. McFadden, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 13, 1974, Ser. No. 450,650

Int. Cl.² C08L *31/02, 33/02*

U.S. Cl. 260—29.6 E **9 Claims**

1. A method for making a crosslinkable aqueous solution which is useful to form soft water-swellable polyacrylate articles which comprises

A. forming a polyacrylate solution having about 30 to about 70 weight percent alkali metal carboxylates by dissolving in an aqueous alkali metal hydroxide solution containing sufficient alkali metal hydroxide to saponify some of the acrylate esters and to neutralize the carboxylic acid groups a polyacrylate comprising

1. about 30 to about 92 percent by weight of an alkyl acrylate wherein the alkyl group has 1–10 carbon atoms, an alkyl methacrylate wherein the alkyl group has 4–10 carbon atoms, or mixtures thereof,
2. about 8 to about 50 percent by weight of an olefinically unsaturated carboxylic acid, and
3. about 0 to about 15 percent by weight of an omega hydroxy-alkyl acrylate having 1–4 carbon atoms in the hydroxy alkyl group

B. heating the solution until saponification is complete, and C. adding to said solution about 0.1 to about 10 weight percent, based on the dissolved polymer, of a water soluble crosslinking agent which is reactive with carboxylate salt groups.

3,926,892
HYDROPHILIC CONTACT LENSES AND LENS POLYMER

Frank O. Holcombe, Jr., Beltsville, Md., assignor to Burton, Parsons & Company, Inc., Washington, D.C.

Filed June 6, 1974, Ser. No. 476,896

Int. Cl.² C08F *216/04*

U.S. Cl. 260—29.6 TA **7 Claims**

1. A hydrophilic gel polymer consisting essentially of the addition copolymer of hydroxyethyl methacrylate and, based on the weight of said hydroxyethyl methacrylate, about 5 to 15 weight percent iso-butyl methacrylate, about 1 to 5 weight percent cyclohexyl methacrylate, and about 0.01 to 0.50 weight percent trimethylolpropane trimethacrylate.

3,926,893
POLISH CONTAINING A C_{21} -CYCLOALIPHATIC DICARBOXYLIC ACID

Fred E. Woodward, West Palm Beach, Fla., assignor to Westvaco Corporation, New York, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,569

Int. Cl.² C08L *91/06*

U.S. Cl. 260—29.6 R **7 Claims**

1. An aqueous polish composition having a solids content between 8 percent and 45 percent comprising,

a. 10 to 100 parts by weight of a water-insoluble addition polymer obtained by the emulsion polymerization of at least one monoethylenically unsaturated monomer,

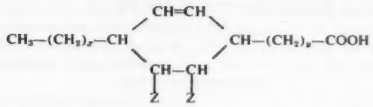
b. 0 to 90 parts by weight of a wax emulsion.

c. 0 to 50 parts by weight of a leveling agent, with parts (a), (b) and (c) equaling 100,

d. wetting, emulsifying, and dispersing agents in an amount of 0.5 percent to 20 percent by weight of the sum of parts (a), (b) and (c), and

e. plasticizing agents in the amount of 5 to 35 percent by weight of the sum of parts (a), (b) and (c),

the improvement wherein at least one of said plasticizing agents is the ammonium salt of a C_{21}-cycloaliphatic dicarboxylic acid having the formula



wherein x and y are integers from 3 to 9, x and y together equal 12, and Z is hydrogen or a carboxyl group with one Z of each moiety.

3,926,894
HARDENABLE, WATER-BASED COATING COMPOSITION FROM AQUEOUS LATICES OF ACRYLIC AND VINYL COMPOUNDS

Vincent de Paul Clark, Heath, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

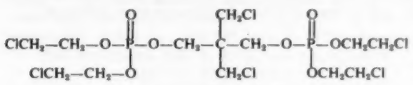
Continuation-in-part of Ser. No. 368,156, June 8, 1973, abandoned. This application Dec. 12, 1974, Ser. No. 532,073

Int. Cl.² C08L *35/00, 33/00;* **C04B** *43/00*

U.S. Cl. 260—29.6 MP **7 Claims**

1. A coating composition for use on fibrous glass thermal insulation comprising an aqueous dispersion of coating solids, the solids consisting essentially of, by weight:

a. 5 to 15 percent of a plasticizer of at least one halogenated organophosphorus compound of tris (haloalkyl) phosphate or a chlorinated phosphate ester having a molecular weight of 583 and the formula:



b. 55 to 85 percent of at least one filler wherein the filler has a particle size distribution ranging from 5 to 30 microns; and

c. 10 to 30 percent of a binder of an aqueous latex of a copolymer of an acrylic resin and a vinyl compound or a copolymer of an acrylic resin and polyethylene, wherein the filler is calcium carbonate, talc wollastonite, clay, barytes or silica.

3,926,895
LIQUID PLASTIC REPAIR COMPOSITION AND METHOD

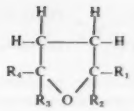
Cecil E. Britain, Wichita, Kans., assignor to Muriel M. Britain; Charles F. Dickinson; Ryta M. Dickinson and Norva M. Bump, all of Wichita, Kans.

Filed Nov. 29, 1973, Ser. No. 419,139

Int. Cl.² C08K *5/07, 5/09, 5/10, 5/15*

U.S. Cl. 260—30.4 R **12 Claims**

1. A plastic repair composition of matter comprising a major proportion of a first solvent selected from the group consisting of methyl ethyl ketone, methyl isobutyl ketone, acetone, cyclohexanone, isophorone, ethyl acetate, butyl acetate, xylol, toluol, amyl acetate, and mixtures thereof, and a minor proportion of a mixture including a second solvent having the formula:



wherein R_1, R_2, R_3 and R_4 are selected from the group consisting of hydrogen, alkyl hydrocarbons containing from between 1 to 6 carbon atoms, and mixtures thereof, a plasticizer selected from the group consisting of tricresyl phosphate, dioctyl phthalate, dibutyl phthalate, and mixtures thereof, a synthetic vinyl copolymer resin product comprising about 90 percent weight vinyl chloride, about 10 percent weight vinyl acetate, and has a molecular weight of about 34,800, and dibutyl tin dilaurate having between about 17 and 20 percent weight tin, said first solvent comprises from between about 9 to about 31 parts by volume per 37 parts by volume of said plastic repair composition, said second solvent comprises from between about 5 to about 15 parts by volume per 37 parts by volume of said plastic repair composition, said dibutyl tin dilaurate comprises from between about 1 part to about 4 parts by volume per 37 parts by volume of said repair composition, said synthetic vinyl copolymer resin product comprises from between approximately 45 pounds to about 65 pounds per 37 gallons of said plastic repair composition, and said repair composition is characterized by a clear and transparent finish.

3,926,896
ORGANOSILICON COMPOSITIONS FOR THE NON-STICK COATING OF CELLULOSIC OR SYNTHETIC MATERIALS

Jean Dumoulin, Villeurbanne, France, assignor to Rhone-Poulenc, S.A., Paris, France

Filed Mar. 18, 1974, Ser. No. 452,388

Claims priority, application France, Mar. 21, 1973, 73.10098

Int. Cl.² C08K *5/10*

U.S. Cl. 260—31.2 R **5 Claims**

1. A non-stick coating composition produced by mixing the following ingredients, parts and percentages being by weight:

i. 100 parts of a dimethylpolysiloxane which is:

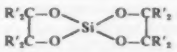
a. an α-ω-dihydroxydimethylpolysiloxane gum having a viscosity of at least about 1 million centipoises at 25°C, or

b. a mixture consisting of at least 75% of a said gum and a low molecular weight dimethylpolysiloxane polymer formed during the preparation of a said gum by polymerisation of a dimethyl-cyclopolysiloxane in the presence of an alkaline or acid catalyst,

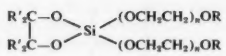
ii. 1 to 15 parts of a silicate ester which is selected from

c. an alkoxyalkyl silicate of the formula: $Si[(OCH_2CH_2)_aOR]_4$ in which R represents an alkyl radical with 1 to 4 carbon atoms and a is 1 or 2, and

d. a cyclic silicate of the formula:



or



in which each R', which may be identical or different, represents an alkyl group with 1 to 5 carbon atoms or a vinyl group, n is zero or 1 and R is as defined above.

iii. 5 to 25 parts of an organic derivative of titanium which is selected from:

e. an alkyl polytitanate which is soluble in hydrocarbon solvents, having the average general formula $Ti_bO_c(OR'')_d$ in which R'' represents an alkyl group with 3 to 8 carbon atoms, b represents an integer of at least 2, c represents an integer of at least 1 and d represents an integer of at least 4, and

f. a mixture consisting of at least 5 percent of a said alkyl polytitanate with an alkyl titanate, the alkyl group having 3 to 10 carbon atoms, and/or a titanium chelate:

iv. 0.3 to 3 parts of an organic derivative of tin, a metal salt of a carboxylic acid or a polymer possessing recurring units of the formula

as catalyst, and

v. 500 to 5,000 parts of an organic solvent.

3,926,897
THERMOSETTING COMPOSITIONS CONTAINING POLY(ARYLACETYLENES) AND AN AROMATIC RING COMPOUND HAVING THE RINGS JOINED THROUGH A KETO GROUP

Lawrence C. Cessna, Jr., Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 316,332, Dec. 18, 1972. This application June 3, 1974, Ser. No. 476,123

Int. Cl.[2] C08F *138/02*

U.S. Cl. 260—32.8 R **9 Claims**

1. A thermosetting composition comprising a blend of (1) a prepolymer of at least one polyacetylenically substituted aromatic compound, said prepolymer having a number average molecular weight from about 900 to about 12,000, a ratio of aromatic protons to olefinic protons greater than about 2.4 and containing from about 5 to about 20 percent acetylenic groups by weight of the prepolymer, with (2) from about 2 to about 200 percent, by weight of the prepolymer, of at least one aromatic organic compound containing at least two six-membered aromatic rings, said rings being coupled with each other through a keto group, said compound or mixtures thereof having a melting point less than about 220°C. and a boiling point greater than about 240°C.

3,926,898
PIGMENTED PRIMER COMPOSITION

Jae Hong Choi, Dayton, and Stephen Allen Miller, Fairborn, both of Ohio, assignors to DAP, Inc., Dayton, Ohio

Filed Nov. 28, 1973, Ser. No. 419,758

Int. Cl.[2] C08K *5/05, 3/22;* **C08L** *67/00*

U.S. Cl. 260—33.4 R **20 Claims**

1. A composition useful for priming porous surfaces comprising a thermoplastic polyester resin

characterized physically by a melting point in the range of 100°–120°C, a viscosity in 35 percent ammoniacal solution of about 30–50 cps, solubility at alkaline pH, solubility in alkanols having 1 to 4 carbon atoms, and characterized chemically as the polymerization product of trimellitic anhydride and isophthalic acid in a molar ratio of about 4-8 to 1, a glycol having 3 to 6 carbon atoms in an amount of 0.7 to 1.2 moles per mole of trimellitic anhydride, and an alkanol having 6 to 16 carbon atoms in an amount sufficient to impart to the resin an acid number of about 190–210;

dissolved in a lower alkanol having 1 to 4 carbon atoms, the weight ratio of said lower alkanol to said resin being in the range of 0.5-4 to 1, and having dispersed therein 5 to 60 percent by weight of at least one pigment; the pH of said composition being in the range of 3 to 6.5.

3,926,899
PROCESS FOR PRODUCING NON-AQUEOUS POLYMER DISPERSIONS

Kurt Nordberg, Graz, Austria, assignor to Vianova-Kunstharz, A. G., Vienna, Austria

Filed July 17, 1973, Ser. No. 379,918

Claims priority, application Austria, July 26, 1972, 6422/72

Int. Cl.[2] C08K *5/01, 5/05;* **C08L** *27/00, 31/02*

U.S. Cl. 260—33.4 R **10 Claims**

1. Process for producing non-aqueous acrylic dispersions from monomers of acrylic or methacrylic acid, or a mixture of said acrylic monomers and subordinate amounts of other alpha, beta-ethylenically unsaturated monomers in organic liquids, in the presence of stabilizers, characterized in that the said monomers are polymerized in the presence of from about 4 – 15 percent by weight, based on the total monomer weight of the dispersion of a stabilizer which is a reaction product of

I. homopolymers of glycidyl(meth)acrylate with a molecular weight of from 10,000 to 50,000;

II. 0.5 – 8 mol percent acrylic acid chloride or methacrylic acid chloride per mol of each glycidyl group of I;

III. 92 – 99.5 mol percent of chlorides of saturated fatty acids with 10 – 24 carbon atoms per mol of each glycidyl group of I;

said polymerization occurring in inert organic liquid comprising aliphatic hydrocarbons with a boiling range of from 60° – 210°C., and in the presence of polymerization initiators.

3,926,900
OIL-RESISTANT BLENDS FOR ELECTRICAL INSULATION

Raymond L. Guzy, Morton Grove, and Rajesh N. Sheth, Chicago, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 13, 1973, Ser. No. 424,262

Int. Cl.[2] C08K *5/01*

U.S. Cl. 260—33.6 AQ **2 Claims**

1. A curable electrical insulation composition exhibiting improved oil and water resistance when cured comprising

a. about 60 to 80 percent by weight of a blend consisting of an ethylene, propylene non-conjugated diene terpolymer having an ethylene/propylene ratio in the range 20/80 to 80/20 and from 2 to about 20% by weight of the terpolymer of non-conjugated diene and a hydrocarbon oil, in a ratio of from about 2:3 to about 3:1 respectively,

b. about 40 to 20 percent by weight of a polybutadiene having greater than 50% 1,2-polymerized units and having a molecular weight between 1,500 and 25,000 g/mole,

c. as a curing agent, about 2 to 6% by weight of a peroxide compound selected from the group dicumyl peroxide and α,α'-bis(t-butylperoxy)-di-isopropyl benzene, and

d. as a curing co-agent, about 1 to 3% by weight of a compound selected from the group m-phenylene dimaleimide and trimethylolpropane trimethylacrylate.

3,926,901
PREPARATION OF SULFUR VULCANIZABLE OIL EXTENDED ELASTOMERIC MATERIAL AND VULCANIZATES THEREFROM

Charles E. Boozer, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.

Division of Ser. No. 278,350, Aug. 7, 1972, abandoned, which is a continuation of Ser. No. 64,141, Aug. 3, 1970, abandoned, which is a continuation of Ser. No. 847,505, July 16, 1969, abandoned. This application Sept. 17, 1973, Ser. No. 398,092

Int. Cl.² C08K *5/01*

U.S. Cl. 260—33.6 AQ **4 Claims**

2. The oil extended sulfur vulcanizable elastomeric EPDM in which an extender oil is admixed with an EPDM prepared by interpolymerizing a monomeric mixture of ethylene, at least one monoethylenically unsaturated hydrocarbon having from 3–16 carbon atoms and 5-ethylidene-2-norbornene present in an amount to provide an initial unsaturation level of 5–25 C=C groups per 1,000 carbon atoms in the unextended sulfur vulcanizable EPDM and in which the unextended EPDM is also reacted to a high Mooney value of at least 80 ML_8 — 250°F, the extender oil being added in an amount within the range of 25–400 phr and is so adjusted to the original Mooney of at least 80 that the Mooney of the oil extended elastomeric material ranges between 40 and about 80.

3,926,902
CROSSLINKABLE THERMOPLASTIC COMPOSITIONS AND PROCESSES THEREFOR

Stephen T. Bowen, Evansville, Ind., assignor to Dart Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 206,507, Dec. 9, 1971, abandoned. This application Feb. 4, 1974, Ser. No. 439,479

Int. Cl.² C08L *67/06*

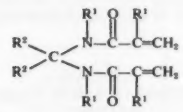
U.S. Cl. 260—40 R **16 Claims**

1. A reinforced polyester molding composition which is a dry, free-flowing, self-feeding solid at room temperature, fusible and injection moldable at temperatures between about 65°C and about 107°C and crosslinkable to the thermoset state upon heating at substantially higher temperatures, comprising:

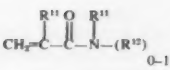
a. a polyunsaturated polyester resin having a melting point above about 65°C;

b. in proportions by weight of from about 5/95 to about 70/30 based upon said polyester resin, an acrylic crosslinking agent of one of the following types:

(i)

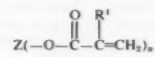


wherein each R^1 independently is H or CH_3; and each R^2 independently is H; C_1 to C_4 alkyl; phenyl; phenyl substituted with any one or more of C_1 to C_4 alkyl, halogen, hydroxy and nitro groups; C_4 to C_6 cycloalkyl; or a radical corresponding to the structure

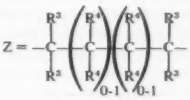


wherein each R^{11} independently is H or CH_3 and R^{12} is a straight or branched chain C_1 to C_8 alkylene group;

(ii)



wherein n is an integer from 2 to 10 and Z is a polyvalent aliphatic, cycloaliphatic or aromatic nuclei; the aliphatic nuclei being defined by



wherein each R^3 and R^4, independently, is H or C_1 to C_4 alkyl; the cycloaliphatic nuclei being cyclohexylene or bismethylene cyclohexane; and the aromatic nuclei being phenylene or phenylene substituted with up to 4 methyl groups, or bismethylene benzene or bismethylene benzene substituted with up to 4 methyl groups; and

iii. the condensation product of hydroxymethyl diacetone acrylamide having a molecular weight in the range of 400 to 3000;

c. from about 0.01 to about 5% based upon the combined weight of (a) + (b) of an organic peroxide initiator having a 10 hour half-life temperature above about 93°C;

d. from about 5 to 75% by weight based upon the total composition of reinforcing fibers; and

e. from about 5 to 75% by weight based upon the total composition of solid filler material, provided that the combined weight of (a) + (b) amounts to at least 20% of the total composition.

3,926,903
CURABLE CRACK-RESISTANT EPOXY RESIN

Daniel A. Scola, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sept. 30, 1974, Ser. No. 510,256

Int. Cl.² C08K *5/15;* **C08L** *63/00*

U.S. Cl. 260—42.28 **2 Claims**

1. A curable resin composition characterized by crack resistance in the temperature range of −65° to 300°F., high tensile strength at room temperature, and a shear strength of at least 5000 p.s.i. at 300°F. consisting essentially of approximately, in weight percent referring to the total weight of components (a) and (b): (a) 92–94% of a glycerol modified bicyclopentadiene ether epoxy resin, (b) 6–8% of a reactive elastomer selected from the group consisting of a hydroxyl terminated homopolymer of butadiene, a carboxyl terminated homopolymer of butadiene, a hydroxyl terminated butadiene-acrylonitrile copolymer, a carboxyl terminated butadiene-acrylonitrile copolymer, a hydroxyl terminated butadiene-styrene copolymer and a carboxyl terminated butadiene-styrene copolymer, and (c) an aromatic polyamine curing agent in an amount sufficient to provide 0.5–2.0 amino hydrogen atoms of the amine for each epoxy group.

3,926,904

CURABLE CRACK-RESISTANT EPOXY RESIN

Daniel A. Scola, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sept. 30, 1974, Ser. No. 510,259

Int. Cl.² C08L *63/00;* **C08K** *5/15*

U.S. Cl. 260—42.28 **3 Claims**

1. A curable resin composition characterized by a high 300°F. and a high room temperature tensile strength and 0°–300°F. crack resistance comprising approximately, in weight percent referring to the total weight of components (a) through (c): (a) 35–75% of a glycerol-modified bicyclopentadiene ether epoxy resin, (b) 25–55% of a polyglycidyl ether of phenol-formaldehyde novolac resin having an epoxy equivalent weight of 170–210 and a viscosity at 52°C of 1,400–90,000 centipoises, (c) 1–15% of a reactive elastomer selected from the group consisting of a hydroxyl or carboxyl terminated butadiene homopolymer, a hydroxyl or carboxyl terminated butadiene-acrylonitrile copolymer and a hydroxyl or carboxyl terminated butadiene-styrene copolymer and (d) an aromatic polyamine curing agent in an amount sufficient to provide 0.5–2.0 amino hydrogen atoms of the amine for each epoxy group.

3,926,905

FLAME RETARDANT HARDENABLE COMPOSITION OF WATER GLASS AND DECORATIVE PRODUCTS MADE BY USING THE SAME

Shinji Nose, Kobe; Shingo Tokuda, Nishinomiya; Motomu Tanaka, Kobe, and Hideaki Tsujimura, Takatsuki, all of Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan

Filed June 7, 1974, Ser. No. 477,459

Claims priority, application Japan, June 13, 1973, 48-66688; July 13, 1973, 48-79563

Int. Cl.² C08K *3/34*

U.S. Cl. 260—42.43 **7 Claims**

1. A flame retardant hardenable composition comprising water glass and a hardener therefor, said composition being incorporated with a resin consisting of a polymer of at least 40% by weight of a diallyl phthalate and not more than 60% by weight of comonomers copolymerized therewith, said resin being incorporated in the composition in an amount of 5–50% based on the total weight of the solids content of said water glass and said resin.

3,926,906

DENTAL FILLING PACKAGE

Henry Lawrence Lee, II, San Marino; Francis Fabian Smith, Los Angeles, and Michael Lawrence Swartz, Encino, all of Calif., assignors to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 736,950, June 14, 1968, abandoned. This application Oct. 15, 1970, Ser. No. 81,156

Int. Cl.² C08K *3/36*

U.S. Cl. 260—42.53 **11 Claims**

1. A method of filling a tooth comprising the steps of:

a. providing a first quantity of paste-like material consisting essentially of: a premixed unpolymerized resin binder system containing active polyfunctional monomer having a central portion which contains at least one aromatic ring and at least two acrylic end groups; a finely-divided, organosilane keying agent-treated, inorganic filler constituting at least 65 percent by weight of said paste-like material; and a free radical generating catalyst for said binder system in which the free radicals when generated in sufficient quantities will produce relatively rapid polymerization of said system;

b. providing a second quantity of paste-like material consisting essentially of: substantially the same premixed unpolymerized resin binder system which is in said first quantity of material; a finely-divided, organosilane keying agent-treated, inorganic filler constituting at least 65 percent by weight of said second quantity of paste-like material; and an activator for said catalyst to cause the aforesaid generation of free radicals in sufficient quantities to produce relatively rapid polymerization of said binder system;

c. extracting from each of said quantities of material approximately equal amounts of the same sufficient to effect the desired tooth restoration;

d. mixing said extracted quantities so that said activator of said second quantity of material reacts with said catalyst of said first quantity of material causing the generation of sufficient free radicials to inititate relatively rapid polymerization of said resin binder system; and

e. promptly filling a tooth with said mixture before it hardens due to polymerization so that after said mixture is in a tooth it will harden in a known and substantially uniform time to form a hard dental filling.

3,926,907

STABILIZED THERMOSET RESINS FROM POLY(ARYLACETYLENES)

Edward Jacob Engle, III, Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jan. 22, 1973, Ser. No. 325,777

Int. Cl. C08f *45/58, 45/28*

U.S. Cl. 260—45.7 P **13 Claims**

1. A thermosetting composition comprising a blend of (1) a prepolymer of at least one polyacetylenically substituted aromatic compound, said prepolymer having a number average molecular weight from about 900 to about 12,000, a ratio of aromatic protons olefinic protons greater than about 2.4 and containiing from about 5 to about 20% acetylenic groups by weight of the prepolymer with (2) from about 0.1 to about 20%, by weight of the prepolymer, of at least one thermal stabilizer selected from the group consisting of the inorganic oxyacids of phosphorous, the ammonium and amine salts of said oxyacids, the alkyl and aryl esters of said oxyacids, and the ammonium and amine salts of said esters which are partial esters, the alkyl group in said alkyl esters containing from 1 to 12 carbon atoms and the aryl group in said aryl esters containing from 6 to 10 carbon atoms.

3,926,908

FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 28, 1973, Ser. No. 429,642

Int. Cl.² C08K *5/04*

U.S. Cl. 260—45.7 S **8 Claims**

1. A flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and a minor amount of an additive selected from the group consisting of the metal salt of substituted and unsubstituted sulfonic acids of aromatic ketones, and mixtures thereof, wherein said metal salts thereof are selected from the group consisting of alkali metals and alkaline earth metals, and mixtures of these metal salts, and said substituent on the metal salt of the substituted sulfonic acids of aromatic ketones is selected from the group consisting of an electron withdrawing radical and mixtures of electron withdrawing radicals.

3,926,909

DIBENZYL HYDROXYL AMINE STABILIZER FOR SPANDEX

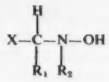
Peter Wei, Barrington, R.I., assignor to Globe Manufacturing Co., Fall River, Mass.

Filed Aug. 16, 1974, Ser. No. 498,217

Int. Cl.² C08G *6/00*

U.S. Cl. 260—45.85 A **16 Claims**

1. Polyurethane stabilized against fume discoloration having incorporated therein a substituted hydroxylamine of the formula



where X is a phenyl or naphthyl group or such a group substituted with alkyl of 1 to 12 carbon atoms, halogen, aryl, aryloxy, alkoxy, hydroxy, carboxy, ester or amide and R_1 and R_2 are X, H or benzyl, the amount of substituted hydroxylamine being sufficient to effectively stabilize against fume discoloration.

3,926,910
REDUCTION OF REACTOR FOULING AND IMPROVEMENT IN THE THERMAL STABILITY OF PVC USING NITRITES

Syed K. Mowdood, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 331,435, Feb. 12, 1973, abandoned. This application Aug. 1o, 1974, Ser. No. 498,162

Int. Cl.² C08K *5/05*

U.S. Cl. 260—45.95 R **7 Claims**

1. The process of making a resinous, thermoplastic polymer from a vinyl monomer polymerizable in a mass polymerization system to said polymer in a reactor which comprises adding from 0.001 to 1.00 part per 100 parts of monomer of an alkali or an alkaline earth metal nitrite at the reactor surface which is in contact with the reaction medium prior to formation of less than 10 percent of said polymer by weight from said monomer.

3,926,911
CROSSLINKED POLYMERS CONTAINING SILOXANE GROUPS

Gerd Greber, Binningen; Roland Darms, Therwil, and Dieter Lohmann, Pratteln, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

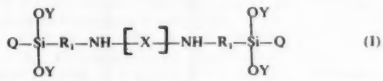
Filed May 24, 1974, Ser. No. 473,047

Claims priority, application Switzerland, June 7, 1973, 8259/73; Aug. 2, 1973, 11230/73

Int. Cl.² C08G *77/04, 77/26*

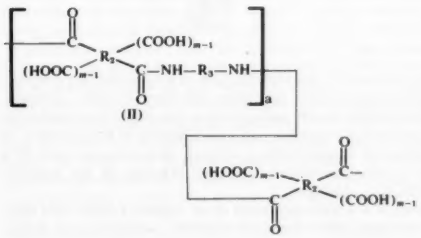
U.S. Cl. 260—46.5 E **12 Claims**

1. Crosslinked polyamides, polyimides or polyamide-imides containing siloxane groups, with a silicon content of 0.1 to 17.0% by weight, which are obtainable by heating silicon-modified polyamide, polyamide-acid or polyamide-amide-acid prepolymers with an inherent viscosity of 0.04 to 4.0, which have the formula I



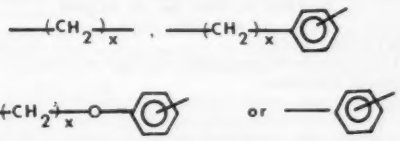
(I)

wherein X represents a structural element of the formula II



(II)

a denotes a number from 0 to 100, and the individual m, R_1, R_2, R_3, Q and Y independently of one another denote the following: m denotes the number 1 or 2, R_1 denotes a radical



with x denoting a number from 1 to 4, R_2 denotes a carbocyclic-aromatic or heterocyclic-aromatic radical, wherein the carbonamide and carboxyl groups are bonded to different ring carbon atoms and the carboxyl groups are each in the ortho-position to a carbonamide group, R_3 denotes an aliphatic radical with at least 2 carbon atoms, or a cycloaliphatic, araliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical, Q denotes methyl, phenyl or a -OY radical, with Y having the meaning indicated below, and Y denotes an alkyl radical with 1 to 6 carbon atoms or a phenyl radical, or corresponding cyclised derivatives, to temperatures between 50° and 350°C.

3,926,912
POLYMERIZING CHLOROPRENE IN THE PRESENCE OF XANTHOGEN DISULPHIDES WITH FUNCTIONAL GROUPS

Rudolf Mayer-Mader, and Wilhelm Göbel, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Germany

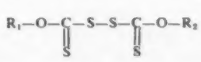
Filed Feb. 6, 1974, Ser. No. 440,014

Claims priority, application Germany, Feb. 10, 1973, 2306610; May 23, 1973, 2352937

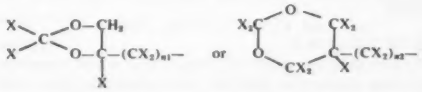
Int. Cl.² C08F *136/16*

U.S. Cl. 260—92.3 **6 Claims**

1. A process for producing a chloroprene polymer which comprises polymerizing 60 to 100 parts by weight of chloroprene and 40 to 0 parts by weight of a member selected from the group consisting of a diene in which the hydrogen atoms may be partially or completely substituted by halogen atoms, an monoethylenically unsaturated copolymerizable monomer or a mixture thereof in the presence of 0.05 to 30 parts by weight of an xanthogen disulphide of the formula



wherein R_1 and R_2 are the same or different and are of the formula



wherein X may be the same or different and is selected from the group consisting of hydrogen, alkyl having 1 to 6 carbon atoms, phenyl, naphthyl, benzyl, chlorine, bromine and iodine and n_1 and n_2 are the same or are different and are each an integer of from 1 to 20.

3,926,913
LOW TEMPERATURE CURING POLYIMIDES

Robert J. Jones, Hermosa Beach, and Howard N. Cassey, Long Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Feb. 15, 1974, Ser. No. 443,058
Int. Cl.² C08G *73/10*
U.S. Cl. 260—47 CP **8 Claims**

1. A process for the preparation of a low temperature curing polyimide comprising:

A. blending an organic compound selected from the group consisting of dianhydride and tetraacid and a free radical catalyst with diaminostilbene not in excess of 50 mole percent and the remainder a nitrogen compound selected from the group consisting of organic diisocyanate and organic primary diamines whereby a mixture of an amide-acid with the catalyst dispersed therethrough is formed;

B. subsequently heating the mixture in a temperature range of from 150° to 200°C to imidize said amide-acid fully; and

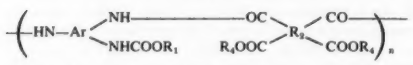
C. heating said imide-catalyst in a temperature range of from 150° to 250°C to activate said catalyst whereby a compliant polyimide is formed.

3,926,914
POLYMERS PREPARED FROM AROMATIC DIAMINOALKOXYCARBOXYLAMINE COMPOUNDS AND DIANHYDRIDES AND METHOD FOR THEIR PREPARATION

Yasuo Miyadera, and Hisao Yokokura, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 6, 1973, Ser. No. 413,232
Int. Cl.² C08G *73/06*
U.S. Cl. 260—47 CP **43 Claims**

1. A polymer including groups having the formula:



wherein Ar is an aromatic radical; R_1 is a monovalent alkyl group having 4 or less carbon atoms, an aryl group having 6 to 12 carbon atoms, a cycloalkyl group having 6 to 12 carbon atoms, and aralkyl group having 7 to 12 carbon atoms or an alkaryl group having 7 to 12 carbon atoms; R_3 is a tetravalent radical of a tetracarboxylic acid; R_4 is hydrogen or the above-defined R_3; and n is a positive integer.

3,926,915
PROCESS FOR PRODUCTION OF ACRYLIC ACID

Yoshihisa Watanabe; Makoto Imanari; Naohiro Nojiri, and Nobuhiko Fuga, all of Ami, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Oct. 10, 1973, Ser. No. 405,140
Claims priority, application Japan, Oct. 16, 1972, 47-102648
Int. Cl.² C07C *51/26, 57/04*
U.S. Cl. 260—530 N **3 Claims**

1. A process for producing acrylic acid which comprises subjecting acrolein to catalytic vapor phase oxidation with molecular oxygen over an oxidation catalyst at a temperature of from 200°C to 350°C and under a pressure of from 0.5 atmosphere to 10 atmosphere, gauge wherein said oxidation catalyst consists essentially of the oxides of (1) molybdenum (2) vanadium (3) niobium and (4) silica and wherein said catalyst consists of:

	gram atomic percent
(1) molybdena	10 – 90
(2) vanadia	0.01 – 60
(3) niobium oxide	0.01 – 70
and (4) silica	up to 200%

based on the total atomic atoms of molybdenum, vanadium and of niobium.

3,926,916
DIELECTRIC COMPOSITION CAPABLE OF ELECTRICAL ACTIVATION

Sebastian Vito Rocco Mastrangelo, Hockessin, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Dec. 22, 1972, Ser. No. 317,381
Int. Cl.² H01B *3/12, 3/30*
U.S. Cl. 252—63.5 **8 Claims**

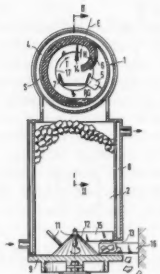
1. Dielectric composition comprising a dielectric organic polymeric binder and normally dielectric filler particles of aluminum having a tarnish film of aluminum oxide as a dielectric surface coating thereon dispersed therein, at least 30 weight % of said filler particles having smooth rounded edges and the polymer of said organic polymeric binder having a glass transition temperature of at least 40°C., which composition is useful as a dielectric material and, in layered form, upon electrical activation, provides a multiplicity of closely spaced, mutually isolated electrically conductive paths.

8. The structure of claim 3 wherein the amount of binder is 15–55 volume % and the amount of filler particles is 45–85 volume %.

3,926,917
PROCESS FOR PERFORMING REACTIONS INVOLVING THE FORMATION OF A SOLID PHASE FROM LIQUID PHASE

Roland Jaccard; Paul Hostettler, both of Basel, and Rudolf Siegrist, Hofstetten, SO, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 155,481, June 22, 1971, Pat. No. 3,819,332. This application Dec. 11, 1973, Ser. No. 423,795
Claims priority, application Switzerland, June 26, 1970, 9707/70
Int. Cl.² C08G *12/32, 12/36*
U.S. Cl. 260—67.6 R **4 Claims**



1. A process for the manufacture of a condensation polymer based on urea and/or melamine and formaldehyde, comprising the steps of mixing an aqueous solution of a precondensate of urea and/or melamine and formaldehyde in the presence of a protective colloid with a solution of sulphamic acid or a water-soluble ammonium hydrogen sulphate of the formula: $[R\text{-}NH_3](^+)\ .\ [SO_4H](^-)$
wherein R is a hydrogen atom or an organic radical that does not adversely affect the water solubility, admitting and depos-

iting this mixture still in a liquid state on an internal surface of a drum rotating about a substantially horizontal axis, controlling the mixture supply and the rotational speed of the drum as a function of the velocity of polymerization so as to maintain a sump of liquid mixture in the drum, peeling the layer of polymer that forms on the surface of the drum and is drawn continuously out of the sump at a point above the sump, and leading the detached layer of polymer out of the drum through a central opening in one of the end walls of the drum.

3,926,918

PROCESS FOR PRODUCING POLYVINYL ACETAL

Yutaka Shibata; Yoshiaki Kodera; Mitsuru Tanaka, all of Shiga; Fumio Kamiyama, Ohyamazaki, and Nakatan, Ohtsu, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 27, 1973, Ser. No. 428,741
Claims priority, application Japan, Dec. 30, 1972, 48-2815
Int. Cl.² C08F *8/28*
U.S. Cl. 260—73 L **13 Claims**

1. A process for preparing polyvinyl acetals by condensing polyvinyl alcohol with an aldehyde in the aqueous phase in the presence of a catalytic amount of an acid catalyst which comprises the following steps:

1. reacting the polyvinyl alcohol with not more than 0.25 mol per 1.0 mol of the $-CH_2-CHOH-$ bond of the polyvinyl alcohol, of an aldehyde at a temperature in excess of 20°C. so as not to precipitate the reaction product,
2. cooling the reaction system at a temperature of not more than 20°C. and further adding an aldehyde while maintaining the reaction system at a temperature of not more than 20°C. thereby to precipitate the reaction product, and
3. heating the reaction system to a temperature of at least 30°C. and continuing the reaction at this temperature for at least 1 hour.

3,926,919

POLYURETHANES CHAIN-EXTENDED WITH 2,2′-DIAMINODIPHENYLDISULFIDE

Anthony F. Finelli, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 23, 1973, Ser. No. 381,464
Int. Cl.² C08G *18/28, 18/32, 18/62*
U.S. Cl. 260—75 NH **5 Claims**

1. A cured polyurethane prepared by the method which comprises curing a composition derived by the method which comprises mixing an excess of a polyisocyanate having an isocyanate functionality of 2 to 3 with a polymeric polyol having an hydroxyl functionality of 2 to 3 and a molecular weight in the range of about 500 to about 6000 by reacting therewith, the primary diamine, 2,2′-diaminodiphenyldisulfide at a temperature in the range of about 20°C to about 150°C, where the ratio of isocyanato groups of the polyisocyanate to the hydroxyl groups of the polymeric polyol is in the range of about 1.3 to about 12 and where the ratio of amine groups of said 2,2′-diaminodiphenyldisulfide to excess isocyanato groups of said polyisocyanate over hydroxyl groups of said polymeric polyol is in the range of about 0.5 to about 1.1.

3,926,920

HOT MELT ADHESIVE BASED ON LOW VISCOSITY HEAT STABLE COPOLYESTERS

Paul C. Georgoudis, Dunellen; Dilip K. Ray-Chaudhuri, Somerville, and Thomas P. Flanagan, Green Brook, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 337,638, March 2, 1973, abandoned. This application Dec. 20, 1974, Ser. No. 534,725
Int. Cl.² C08G *63/16*
U.S. Cl. 260—75 R **5 Claims**

1. A hot melt adhesive copolyester derived from the reaction of a mixture consisting essentially of:

A. at least one aliphatic primary glycol having from 2-6 carbon atoms and

B. a mixture totaling 100 mole per cent of the following dicarboxylic acids or their dicarboxylic acid functioning derivatives: 25–65 mole per cent of terephthalic acid, 25–65 mole per cent of isophthalic acid, and 5–20 mole per cent of phthalic acid; said glycol component A being chosen such that any copolyester obtained has a melting point no greater than 150°C.

3,926,921

PHARMACEUTICAL COMPOSITIONS COMPRISING MIXED SALTS OF SULFOGLYCOPEPTIDES WITH METAL AND ORGANIC BASES

Adriano Butti, Como, and Giuseppe Prino, Milan, both of Italy, assignors to Crinos Industria Farmacobiologica SpA, Guardia, Italy

Filed Mar. 22, 1974, Ser. No. 453,764
Claims priority, application Italy, Mar. 27, 1973, 22212/73
Int. Cl.² A61K *37/00;* **A01N** *9/00, 9/22*
U.S. Cl. 424—177 **16 Claims**

1. An orally administrable pharmaceutical composition, comprising:

an amount effective for the treatment of gastroduodenal diseases of a mixed salt, wherein the anionic moiety is a sulfoglycopeptide polyanion and the cationic moiety is:

a. a metal cation selected from the group consisting of the alkali and alkaline-earth metal cations, and

b. the cation of a nitrogen-containing organic base having spasmolytic and anticholinergic activities; and

a pharmaceutically acceptable carrier or coating.

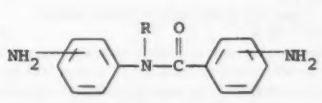
3,926,922

POLYURETHANE ELASTOMERS PREPARED FROM DIAMINE CURING AGENTS

Richard C. Baron, North Andover; Leon D. Cerankowski, Carlisle, and Neil Mattucci, Billerica, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 14, 1974, Ser. No. 451,078
Int. Cl.² C08G *18/06*
U.S. Cl. 260—77.5 AM **20 Claims**

1. A polyurethane product prepared by reacting an isocyanate terminated urethane prepolymer and a curing agent of the formula:



wherein R is hydrogen or alkyl.

3,926,923
AROMATIC POLYESTER-AMIDES

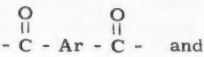
Jack Preston, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 352,846, April 19, 1973, abandoned. This application Mar. 7, 1974, Ser. No. 448,846

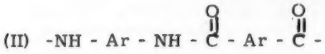
Int. Cl.[2] C08G *69/44*

U.S. Cl. 260—78 R **9 Claims**

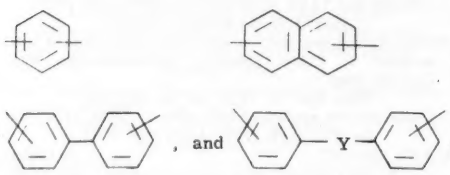
1. A high molecular weight fiber-forming polymer composed of recurring units selected from the group consisting of



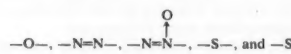
and



wherein R is a branched or linear C_2–C_8 alkylene radical and each Ar is individually selected from the group consisting of



wherein Y is selected from the group consisting of a branched or linear C_1–C_4 alkylene radical



and wherein at least 35% by weight of the polymer is composed of units (I).

3,926,924
POLYAMIDE COPOLYMERS FROM HEXAMETHYLENE DIAMMONIUM ADIPATE/TEREPHTHALATE AND A THIRD POLYAMIDE FORMING REACTANT

Owen Burchell Edgar, Manchester, and Michael Richard Yates, Leeds, both of England, assignors to Imperial Chemical Industries Ltd., London, England

Continuation of Ser. No. 201,966, Nov. 24, 1971, abandoned, which is a continuation of Ser. No. 578,521, Sept. 12, 1966, abandoned. This application Oct. 18, 1973, Ser. No. 407,679

Claims priority, application United Kingdom, Sept. 16, 1965, 39587/65

Int. Cl.[2] C08G *69/26, 69/14, 69/08*

U.S. Cl. 260—78 R **3 Claims**

1. A fibre forming copolyamide consisting essentially of the polymeric condensation product of (1) at least 50% by weight, based on the weight of the copolyamide, of hexamethylene diammonium adipate, (2) 20 – 40% by weight of hexamethylene diammonium terephthalate and (3) 2 – 20% by weight of epsilon caprolactam.

3,926,925
NOVEL POLYMERS OF OLEFINS AND POLAR MONOMERS

Irving Kuntz, Linden, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed July 27, 1973, Ser. No. 383,093

Int. Cl.[2] C08F *4/14, 220/14, 220/18*

U.S. Cl. 260—78.5 R **8 Claims**

1. A composition of matter comprising an interpolymer of from 20 to 60 mole % of one or more monoolefins of from 4 to 24 carbon atoms wherein said monoolefin is selected from the group consisting of branched 2-substituted-1-olefins and vinyl ethers, from 80 to 40 mole % of an acrylic acid ester where the ester moiety has from 1–20 carbon atoms, and from 0.05 to 35 mole % of a monomer selected from the group consisting of (a) diesters of fumaric acid, (b) diamides of fumaric acid, (c) derivatives of maleic acid selected from the group consisting of diesters, diamides, imides, and the anhydride, (d) C_1–C_8 alkyl substituted maleic acid derivatives selected from the group consisting of diesters, diamides, imides, and the anhydride, the interpolymer having an inherent viscosity greater than 0.3 when measured in benzene at 25°C.

3,926,926
THERMOPLASTIC ACRYLONITRILE COPOLYMERS

George S. Li, Aurora, and Gerald P. Coffey, Cleveland Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Nov. 20, 1974, Ser. No. 525,376

Int. Cl.[2] C08F *244/00*

U.S. Cl. 260—85.5 B **3 Claims**

1. The composition resulting from the copolymerization of (A) from 50 to 90% by weight of acrylonitrile and (B) from 10 to 50% by weight of at least one member selected from the group consisting of indene and coumarone.

3,926,927
STRIPPING MONOMERS FROM A SLURRY OF COPOLYMERIZED ACRYLONITRILE

Donald J. Stookey, Decatur, Ala., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 25, 1974, Ser. No. 526,665

Int. Cl.[2] C08F *124/00*

U.S. Cl. 260—85.5 S **4 Claims**

1. The method of stripping unreacted monomers from a slurry containing about 8 to 50 weight percent solids of a polymer composed of at least 35 weight percent acrylonitrile copolymerized with up to 65 percent of one or more other mono-olefinic monomers copolymerizable with acrylonitrile and up to about 70 weight percent unreacted monomers, based on slurry weight,

a. feeding the slurry downward through a treatment zone having a sequence of surfaces each having therein perforations through which the slurry can flow downward onto the next surface in the sequence,

b. forcing steam upward through the perforations in countercurrent flow to the slurry to strip unreacted monomers from said slurry, and

c. repeatedly cycling the steam flow rate back and forth from a first flow rate to a second flow rate, said first flow rate being such that the slurry will not flow downward through the perforations while the steam is flowing at said first flow rate, said second flow rate being such that the slurry flows downward through the perforations in the surfaces during the time period of said second flow rate, said first flow rate being carried out for a first time period of 5 to 15 seconds, said second flow rate being carried out for a second time period of 1 to 10 seconds.

3,926,928
CATALYST AND PROCESS FOR THE POLYMERIZATION OF ALPHA-OLEFINS

Nicholas M. Karayannis, Hinsdale; Missak Khelghatian, Naperville, and Sam S. Lee, Hoffman Estates, all of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Aug. 27, 1973, Ser. No. 391,608
Int. Cl.² B01J *31/02*; **C08F** *210/00, 212/00, 110/02*
U.S. Cl. 260—88.2 **14 Claims**

1. A composition which comprises:
a. a material selected from the group consisting of a trialkyl aluminum, a mixture of trialkyl aluminum and an alkylaluminum dichloride or dibromide, a mixture of a trialkyl aluminum and a dialkylaluminum chloride or bromide and a dialkylalumimum chloride or bromide,
b. titanium trichloride,
c. an alkyltin sulfide, and
d. a trihydrocarbylphosphite.

2. A composition which comprises:
a. a material selected from the group consisting of a trialkyl aluminum, a mixture of a trialkyl aluminum and an alkylaluminum dichloride, a mixture of a trialkyl aluminum and a dialkylaluminum chloride, and a dialkyl-aluminum chloride,
b. titanium trichloride,
c. an alkyltin sulfide, and
d. a trihydrocarbylphosphite.

3. A composition which comprises:
a. a dialkylaluminum chloride, and
b. titanium trichloride, and
c. an alkyltin sulfide, and
d. a trihydrocarbylphosphite.

8. A process wherein propylene or propylene and at least 1 other alpha-olefin of from 2 to about 8 carbon atoms is contacted by at least a catalytic amount of a composition to form highly-crystalline polypropylene or copolymer wherein the polypropylene is still substantially crystalline comprising:
a. a compound selected from the group consisting of a trialkyl aluminum, a mixture of a trialkyl aluminum and an alkylaluminum dichloride or dibromide, a mixture of a trialkyl aluminum and a dialkylaluminum chloride or bromide, and a dialkylaluminum chloride or bromide,
b. titanium trichloride,
c. an alkyltin sulfide, and
d. a trihydrocarbylphosphite.

9. A process wherein propylene or propylene and at least 1 alpha-olefin of from 2 to about 8 carbon atoms is contacted by at least a catalytic amount of a composition to form highly-crystalline polypropylene or copolymer wherein the polypropylene is still substantially crystalline comprising:
a. a compound selected from the group consisting of a trialkyl aluminum, a mixture of a trialkyl aluminum and an alkylaluminum dichloride, a mixture of trialkyl aluminum and a dialkyl-aluminum chloride and a dialkylaluminum chloride,
b. titanium trichloride,
c. an alkyltin sulfide, and
d. a trihydrocarbylphosphite.

3,926,929
PROCESS FOR POLYMERIZATION OF OLEFIN

Nobuo Enokido; Atsushi Murakami, both of Kawasaki; Kazuo Yamaguchi, Tokyo; Natsuki Kanoh, Yokohama; Toru Tanaka, Kawasaki; Shigeaki Okano, Yokohama, and Masatoshi Suzuki, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 244,939, April 17, 1972, abandoned. This application Mar. 7, 1974, Ser. No. 448,885
Claims priority, application Japan, Apr. 16, 1971, 46-24358; June 18, 1971, 46-43786
Int. Cl.² C08F *4/14, 10/00, 10/02*
U.S. Cl. 260—85.3 R **5 Claims**

1. A process for the polymerization of an olefin which comprises reacting said olefin in contact with a catalyst system comprising (a) an organo-aluminum compound of the formula AlR_nX_{3-n} wherein R represents a hydrocarbon group of 1–14 carbon atoms; X represents a hydrogen atom, halogen atom or an alkoxy group; and *n* represents an integer of 1–3; and (b) a solid catalyst reaction product of an organo-tin compound of the formula

$$SnR_3Y$$

wherein R represents a hydrocarbon group of 1–14 carbon atoms; Y represents a halogen atom or an alkoxy group having 1–14 carbon atoms, and a Group III metal halide selected from the group consisting of aluminum trihalide and boron trihalide with a mixture or reaction product of a titanium compound having the formula

$$Ti(OR)_nX_{4-n}$$

wherein R represents an alkyl group; X represents halogen atom; and *n* represents an integer of 0–4 titanyl dichloride, titanyl dibromide or titanium acetylacetonate and a vanadium compound having the formula

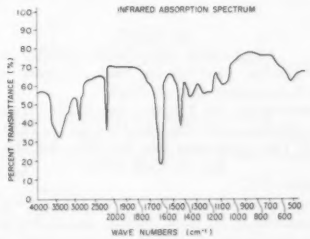
$$V(OR)_{4-n}X_n,\ VO(OR)_{3-m}X_m$$

wherein R represents an alkyl group; X represents a halogen atom and *n* represents an integer of 0–4 and *m* represents an integer of 0–3 or vanadium acetylacetonate wherein said reaction product (b) is formed at a temperature of 0°–150°C wherein the atomic ratio of the organo-tin compound to the Group III metal halide is 0.01 – 100, and the atomic ratio of the Group III metal halide to the titanium compound and the vanadium compound is 0.1 – 10.

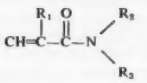
3,926,930
HYGROSCOPIC ACRYLIC SYNTHETIC FIBERS AND METHOD FOR PREPARING THE SAME

Toshio Ohfuka; Yoshihisa Schichijo; Yasushi Ichikawa, and Katsuo Yamamoto, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushika Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 138,875, April 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 30,540, April 20, 1970, abandoned. This application Sept. 6, 1973, Ser. No. 394,937
Claims priority, application Japan, May 8, 1969, 44-34782
Int. Cl.² C08F *220/48, 224/00, 226/06*
U.S. Cl. 260—85.5 S **2 Claims**



1. A polymer hydrolyzate produced by hydrolyzing with nitric acid a polymer comprising at least 85% by weight of acrylonitrile, 0.5 – 10% by weight of N,N-substituted acryl- or methacryl-amide having the general formula of



(wherein R_1 represents a hydrogen atom or a methyl group; R_2 and R_3 represent alkyl groups having 1 to 3 carbon atoms, the sum total of carbon atoms of R_2 and R_3 being not more than 4, or R_2 and R_3 being cyclically connected to each other to form a pyrrolidine or morpholine structure) and 0 – 15% by weight of a compound selected from the group consisting of methyl acrylate, ethyl acrylate, methyl methacrylate, ethyl methacrylate, vinyl acetate, methyl vinyl ketone, styrene, vinyl chloride, vinyl fluoride, vinyl bromide, vinylidene chloride, 2-vinylpyridine, 2-methyl-5-vinylpyridine, N,N-diethylaminoethyl methacrylates, allysulfonic acid and styrene sulfonic acid, the hydrolysis being carried out to such a degree that an amide group of 1680 cm^{-1} is formed in the infrared absorption spectrum and the ODR of 1680 cm^{-1} to 1450 cm^{-1} is in the range of 1.2 – 1.8, said polymer hydrolyzate having a moisture regain of 3.0 % to 10% at a relative humidity of 65% at 20°C.

3,926,931

METHOD FOR SUSPENSION-POLYMERIZING VINYL CHLORIDE

Shunichi Koyanagi, Naoetsu; Shigeru Arai, Yachiyo; Shigenobu Tajima, Naoetsu, and Kazuhiko Kurimoto, Shimoyo-Shinden, all of Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

Continuation-in-part of Ser. No. 127,768, March 24, 1971, abandoned. This application July 25, 1973, Ser. No. 382,458
Claims priority, application Japan, Apr. 13, 1970, 45-31755
Int. Cl.² C08F *1/11, 3/30, 15/00*
U.S. Cl. 260—92.8 W **4 Claims**

1. In a method for suspension-polymerizing at least one monomer taken from the class consisting of vinyl chloride and a mixture of vinyl monomers having vinyl chloride as a main component in the presence of a suspending agent and a polymerization catalyst in an aqueous medium under agitation and with primary cooling in a vessel, said vessel having a condenser for auxiliary cooling, a passageway between said vessel and said condenser for flow of fluid from said vessel to said condenser, the improvement which comprises isolating said condenser from said vessel by keeping said passageway closed until a conversion of at least 5% is obtained, then opening said passageway and maintaining said auxiliary cooling when said passageway is open.

3,926,932

PLATABLE POLYPROPYLENE

Ismat A. Abu-Isa, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 238,464, Nov. 27, 1972, abandoned, which is a division of Ser. No. 66,127, Aug. 21, 1970, Pat. No. 3,695,917. This application Jan. 28, 1974, Ser. No. 436,881
Int. Cl. C08f *29/02*
U.S. Cl. 260—93.7 **1 Claim**

1. Plating grade polypropylene flakes for forming into rigid articles destined to be metal plated, said flakes comprising principally high molecular weight polypropylene and methyl abietate in which the methyl abietate comprises about 5 to about 7% by weight of the combined polypropylene and methyl abietate, said high molecular weight polypropylene having a heat deflection of at least about 94°C. under a 66 psi load test according to ASTM standard (ASTM D648).

3,926,933

CATALYSTS FOR PRODUCING HIGH TRANS-POLYBUTADIENE

Floyd E. Naylor, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 1, 1974, Ser. No. 447,201
Int. Cl.² C08D *3/08, 1/14*
U.S. Cl. 260—94.3 **6 Claims**

1. A method for polymerizing 1,3-butadiene to produce high trans-polybutadiene comprising:
contacting 1,3-butadiene under polymerization conditions with a catalyst comprising three components;
wherein the first component of said catalyst is an oxyether solution of $LiAlH_4$;
wherein the second component of said catalyst is a titanium halide component selected from the group consisting of titanium tetrachloride plus molecular iodine, titanium tetrabromide plus molecular iodine, and titanium tetraiodide; and
wherein the third component of said catalyst is at least one thioether represented by the general formula

$$R\text{-}S\text{-}R'$$

wherein R and R′ are hydrocarbon radicals selected from the group consisting of alkyl and cycloalkyl radicals containing from about 1 to 12 carbon atoms, or R and R′ are hydrocarbon radicals selected from the group consisting of alkylene groups joined to the sulfur atom and to each other to form a saturated heterocyclic thioether containing from about 4 to 10 carbon atoms.

3,926,934

POLYETHYLENE POWDERS

Joseph A. Lasswell, Orange, Tex., and Francis E. Brown, Shawnee, Kans., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 5,141, Jan. 22, 1970, abandoned. This application Aug. 9, 1971, Ser. No. 170,326
Int. Cl.² C08F *2/16, 6/00, 10/02, 110/02*
U.S. Cl. 260—94.9 A **5 Claims**

1. A process for the manufacture of free-flowing polyethylene powders containing substantial concentrations of adsorbed water which consists essentially of introducing a water-soluble initiator and a dispersing agent selected from the group consisting of polyvinyl alcohol and polyvinyl pyrrolidone into a polymerization zone, introducing ethylene into said polymerization zone, introducing water into said polymerization zone at a rate so as to maintain a weight ratio of water to ethylene in said polymerization zone in the range of 2:1 to 6:1, maintaining a polymerization temperature in the range of 60° to 90°C. in said polymerization zone, maintaining a polymerization pressure above 10,000 psig in said polymerization zone, continuing the polymerization for a perid of time sufficient so that the formed polyethylene solids constitute about 20–35 percent by weight of the combined weight of polyethylene and water, venting the reaction mixture, and recovering polyethylene powders containing substantial concentrations of adsorbed water.

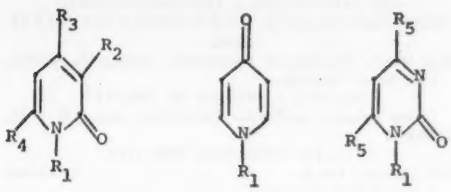
3,926,935

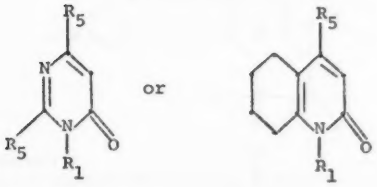
ANTICOCCIDIAL COMPLEXES

Edward F. Rogers, Middletown; Richard A. Dybas, Edison, and John Hannah, Matawan, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 316,180, Dec. 18, 1972, abandoned. This application Sept. 26, 1974, Ser. No. 509,381
Int. Cl.² C07C *127/00*
U.S. Cl. 260—96.5 R **6 Claims**

1. A complex of 4,4′-dinitrocarbanilide and one of the heterocyclic compounds having the formula:





wherein R_1 is methyl or ethyl; R_2 is hydrogen or lower alkoxy; R_3 and R_4 are the same and are (a) lower alkyl when R_2 is hydrogen and (b) hydrogen when R_2 is lower alkoxy; and R_5 is lower alkyl.

3,926,936
PROCESS FOR MANUFACTURING VALUABLE PRODUCTS FROM TALL OIL PITCH

Timo Pellervo Lehtinen, Oulu, Finland, assignor to Oulo Osakeyhtio, Oulu, Finland

Filed Nov. 15, 1973, Ser. No. 416,101

Claims priority, application Finland, Nov. 17, 1972, 3237/72

Int. Cl.² C09F *1/04*

U.S. Cl. 260—97.5 **14 Claims**

1. A process for the manufacture of products from tall oil pitch produced in the distillation of tall oil, comprising:

a. saponifying tall oil pitch by heating it at a temperature in the range 200°–300°C. together with an alkali saponification agent, the amount of said agent comprising 5–25% of the amount of pitch until a main portion of the sterols liberated from fatty and rosin acid esters have been converted to hydrocarbons by dehydration,

b. acidifying the reaction product thereby obtained to form an oil having an acid value in the range 50–150,

c. distilling the obtained oil under a pressure of less than 50 mm Hg to obtain a distillate, 10–70%, of which the acid value is 100–190, and a distillation residue of which the softening point (ball and ring) is not lower than 50°C.

3,926,937
POLYMERIC SOMATOSTATIN

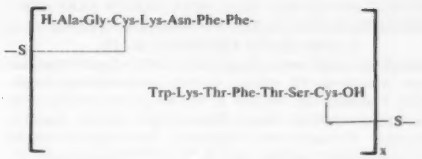
Norman H. Grant, Wynnewood, and Dimitrios Sarantakis, Audubon, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 18, 1974, Ser. No. 462,149

Int. Cl. C07c *103/52;* **C08h** *1/00;* **A61k** *37/00*

U.S. Cl. 260—112.5 **1 Claim**

1. Polymeric reduced somatostatin containing from about 0.090 to about 1.0 milliequivalents free sulfhydryl groups per millimole of polymer, of molecular weight from 3,636 to about 182,000, bonded by Cys 3-3, Cys 3-14 and Cys 14-14 disulfide linkages, presenting the formula:



in which each of the amino acid units containing an asymmetric α-carbon atom is in the L-configuration, *x* is an integer from 2 to 100, inclusive; protamine zinc complexes, protamine aluminum complexes and mixtures thereof.

3,926,938
SYNTHESIS OF SALMON CALCITONIN

John Lawrence Hughes, Kankakee; Jay Kenneth Seyler, Bourbonnais, and Robert Chung-Huang Liu, Kankakee, all of Ill., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

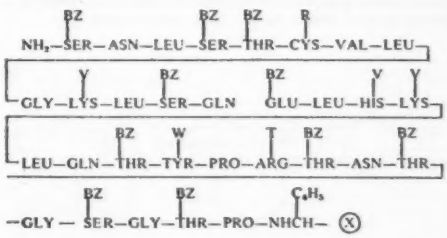
Filed Aug. 12, 1974, Ser. No. 496,539

Claims priority, application Japan, Dec. 7, 1972, 47-121973

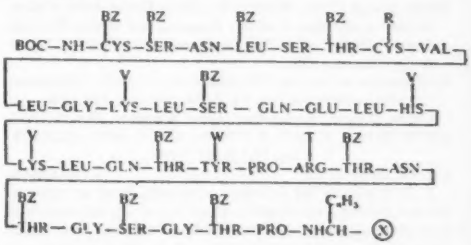
Int. Cl.² C07C *103/52;* **C07G** *7/00*

U.S. Cl. 260—112.5 **23 Claims**

12. In a process for synthesizing salmon calcitonin the step of mixing



with the reactant BOC-BZ-L-cysteine or an active ester, an azide or an anhydride thereof and unless said reactant is an active ester, an azide or an anhydride, in the presence of a diimide, to obtain



where X

is divinylbenzene crosslinked polystyrene resin,

BZ is benzyl, 4-methoxybenzyl, 3,4-dimethylbenzyl, 4-chlorobenzyl, 2,6-dichlorobenzyl, 4-nitrobenzyl, or benzylhydryl,

T is nitro or tosyl,

W is BZ, benzyloxycarbonyl, 2-chlorobenzyloxycarbonyl, 2-bromobenzyloxycarbonyl or hydrogen,

V is benzyloxycarbonyl, 2-bromobenzyloxycarbonyl or 2-chlorobenzyloxycarbonyl,

BOC is tertiary-butyloxycarbonyl

and

R is an n-alkylthio group.

3,926,939
METHOD OF EXTRACTING PURE SERUM ALBUMIN FROM BIOLOGICAL FLUIDS USING A SALT OF A CARBOXYLIC ALIPHATIC ACID

Mikhail Ivanovich Ivanov, Kuzminki, Moskovskaya Veterinarnaya Akademia, 10, kv. 9; Anatoly Alexandrovich From, ulitsa Flotskaya 28, korpus 1, kv. 84; Anatoly Efimovich Kiseley, ulitsa Kostyakova, 8/6, kv. 182, all of, Moscow; Alexandr Alexandrovich Nikitenko, Krasnogorsky raion, Petrovo-Dalnee, Institut, dom 5, kv. 47, Moskovskaya oblast; Valentin Mikhailovich Rusanov, Slavyansky bulvar, 27, kv. 192, Moscow, and Leonid Ivanovich Skobelev, Prospekt Mira, 169, kv. 32, both of Moscow, all of U.S.S.R.

Filed Aug. 24, 1973, Ser. No. 391,312

Int. Cl.[2] A23J *1/06;* **C07G** *7/00*

U.S. Cl. 260—122 **7 Claims**

1. A method of extracting pure serum albumin from biological fluids, which comprises the steps of treating biological fluids with a lower aliphatic alcohol at a volume concentration of 15 to 35% in the presence of 0.1 to 0.6 weight percent of the solution of a salt of a carboxylic aliphatic acid with a non-toxic cation and anion containing from 6 to 12 carbon atoms at a temperature of from 1° to 30°C. and a pH of from 3.3. to 3.5, whereby the concomitant proteins are at least partly denatured; precipitating the denatured and native concomitant proteins at a pH from 4 to 5 and at a temperature of from 1° to 35°C, whereby the non-protein impurities which form complexes with the albumin are split off therefrom and adsorbed by the resulting precipitate; and separating the solution containing pure serum albumin from said precipitate at a temperature of from 1 to 30°C and at pH of from 4 to 5.

3,926,940
PROTEIN RECOVERY PROCESS FROM DEFATTED SOYBEANS USING WATER TO REDUCE AMOUNT OF MISCIBLE SOLVENT

Sidney Joseph Circle; Richard Raymond Fergle, both of Richardson; Leslie Ray Watkins, Houston, and Daniel Edwards Hooton, Dallas, all of Tex., assignors to Anderson, Clayton & Co., Houston, Tex.

Continuation of Ser. No. 189,505, Oct. 15, 1971, abandoned. This application Jan. 14, 1974, Ser. No. 432,886

Claims priority, application United Kingdom, Nov. 5, 1970, 52578/70; Nov. 5, 1970, 52579/70; Nov. 5, 1970, 52580/70

Int. Cl.[2] A23J *1/14*

U.S. Cl. 260—123.5 **20 Claims**

1. In a process for recovery of protein from an aqueous solution having a pH between about 6 and 12, the protein in said solution having been derived from soybeans from which substantially all oil has been removed, in which process acid is added to the solution to reduce its pH sufficiently to cause the protein to precipitate as a curd and the protein is treated with a water-miscible organic solvent to remove undesirable color and flavor constituents, said solvent being added either before or after the precipitation of the curd, the improvement comprising providing a series of N zones wherein N is an integer of at least 1 and in each of which zones the solvent-treated curd is intimately mixed with water forming a mixture of liquid and curd, the mixture is passed to a separator and the curd separated from the liquid, said zones being sufficient to reduce the amount of solvent in the curd to less than about 10% by weight of the liquid portion of the curd without appreciable denaturation of protein of the curd.

3,926,941
AZO DYES HAVING A TRIAZOLIUM DIAZO COMPONENT RADICAL WITH A FUSED CYCLOALKYL RING

Beat Henzi, Neuallschwil, Switzerland, assignor to Sandoz, Ltd., Basel, Switzerland

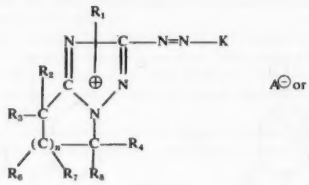
Filed Aug. 8, 1973, Ser. No. 386,775

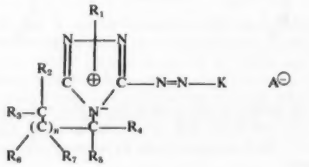
Claims priority, application Switzerland, Aug. 10, 1972, 11843/72

Int. Cl.[2] C09B *29/36;* **D06P** *1/41*

U.S. Cl. 260—146 R **26 Claims**

1. A dye of the formula

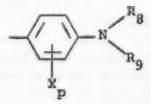


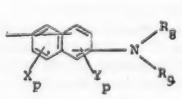
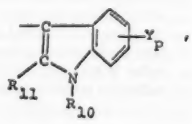


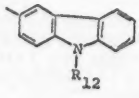
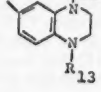
wherein

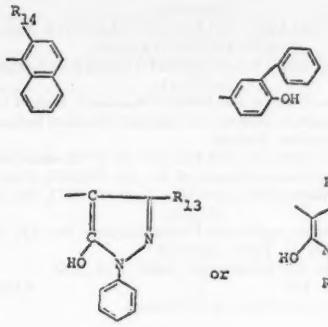
R_1 is alkyl, alkyl monosubstituted by hydroxy, phenyl, alkoxy or carbamoyl, alkenyl of 2 to 4 carbon atoms, alkoxy or cycloalkyl of 5 to 7 carbon atoms,

each R_2, R_3, R_4, R_5, R_6 and R_7 is independently hydrogen, alkyl, cycloalkyl of 5 to 7 carbon atoms or phenyl,

K is  ,

 ,  ,

 ,  ,



wherein each of

R_8 and R_9 is independently hydrogen, alkyl, phenyl, cycloalkyl of 5 to 7 carbon atoms, alkylphenyl or alkyl monosubstituted by halo, phenyl, alkoxy, phenoxy, phenylcarbamoyloxy, alkylcarbonyloxy, alkoxycarbonyl, hydroxy, benzoyloxy or cyano, with the proviso that when R_8 or R_9 is phenyl, cycloalkyl of 5 to 7 carbon atoms or alkylphenyl, the other is other than phenyl, cycloalkyl of 5 to 7 carbon atoms or alkylphenyl, or

R_8 and R_9 taken together and with the nitrogen atom to which they are joined are pyrrolidino, piperidino, morpholino or piperazino,

R_{10} is hydrogen or alkyl

R_{11} is alkyl or

R_{12} is hydrogen or alkyl, each R_{13} is independently hydrogen or alkyl,

R_{14} is hydroxy, amino, anilino or anilino monosubstituted or disubstituted by alkyl,

R_{15} is hydrogen, alkyl or alkoxyalkyl,

each X is independently halo, alkyl or alkoxy,

each Y is independently halo, nitro, amino, cyano, thiocyano, hydroxy, alkyl, alkoxy, trifluoroalkyl, trichloroalkyl, phenyl, phenoxy, alkylamino, dialkylamino, alkylcarbonyl, alkylcarbonyloxy, alkylcarbonylamino, alkylsulfonyl, phenylsulfonyl, sulfamoyl, alkylsulfonylamino or phenylsulfonylamino, and

each p is independently 0 to 2,

A^- is an anion, and

n is 1 to 10,

wherein each alkyl, alkoxy, alkyl moiety and alkoxy moiety independently has 1 to 4 carbon atoms.

3,926,942

METALLIZED FORMAZAN COMPOUNDS CONTAINING A REACTIVE GROUP

Michael Yelland, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

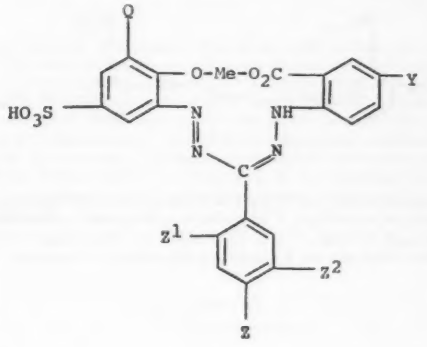
Filed Aug. 13, 1973, Ser. No. 387,727

Claims priority, application United Kingdom, Aug. 31, 1972, 40320/72

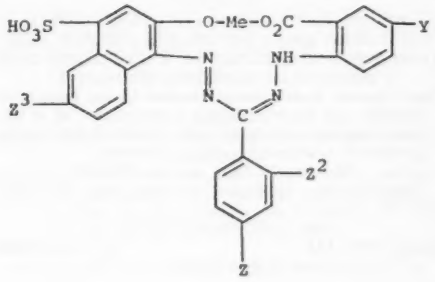
Int. Cl.[2] C09B 62/08; D06P 1/382; C09B 62/24

U.S. Cl. 260—146 T 6 Claims

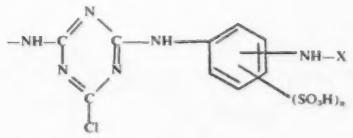
1. A dyestuff having the formula



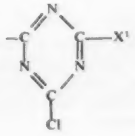
or



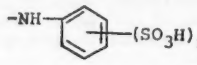
wherein one of Q, Y and Z is

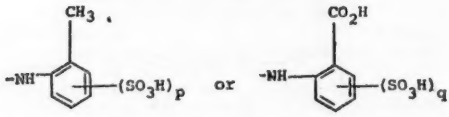


wherein n is 1 or 2 and X is β-sulphatoethylsulphonyl, 2,4-dichloropyrimid-6-yl, 2,4,5-trichloropyrimid-6-yl, 2,4-dichloropyrimid-5-yl carbonyl, 2,3-dichloroquinoxalin-6-yl carbonyl, β-chloropropionyl or



wherein X^1 is Cl, OCH_3, $OCH(CH_3)_2$, NH_2,





wherein *m* is 0, 1 or 2, p is 1 or 2 and q is 0 or 1, Q otherwise being H, Cl or SO_3H, Y otherwise being SO_3H and Z otherwise being H or SO_3H, Z^1 is H, Cl or SO_3H, Z^2 is H or SO_3H, Z^3 is H or SO_3H and Me is copper, nickel, cobalt or chromium.

3,926,943

AZO PIGMENTS WITH AN ANTHRAQUINONYL COMPONENT AND A β-HYDROXYNAPHTHOIC ACID COMPONENT SUBSTITUTED BY A TRIMELLITIC ACID IMIDE VIA AN O-PHENYLENEDIAMINE

Peter Dimroth, Ludwigshafen; Manfred Gaeng, Bobenheim-Roxheim, and Guenther Ruider, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

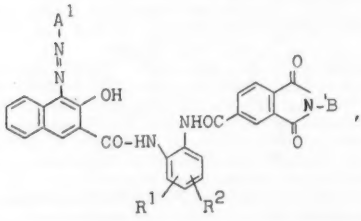
Filed Oct. 19, 1973, Ser. No. 408,057

Claims priority, application Germany, Sept. 21, 1973, 2251747

Int. Cl.² C09B *29/36, 43/12*

U.S. Cl. 260—152 **2 Claims**

1. An azo pigment of the formula



wherein:

A^1 is anthraquinonyl-1;

R^1 is hydrogen, chlorine, methyl or methoxy; and

B is hydrogen, methyl, ethyl, t-butyl, phenyl or phenyl substituted by chlorine, bromine, methyl, ethyl, isopropyl, methoxy, ethoxy, cyano, carbomethoxy, carboethoxy, carbamoyl or sulfamoyl.

3,926,944

WATER-SOLUBLE CELLULOSE REACTIVE AZO DYESTUFFS CONTAINING 3-AZO-2-HYDROXY-N-SUBSTITUTED PYRID-6-ONE RADICAL

Alistair Howard Berrie, and Richard Budziarek, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

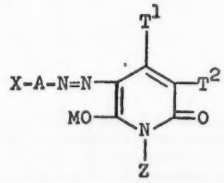
Continuation of Ser. No. 100,413, Dec. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 860,033, Sept. 22, 1969, abandoned. This application Aug. 10, 1973, Ser. No. 387,334

Claims priority, application United Kingdom, Dec. 22, 1969, 60322/69; July 27, 1970, 36199/70

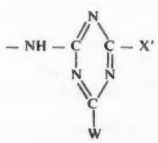
Int. Cl.² C09B *29/36;* **D06P** *1/38, 3/66*

U.S. Cl. 260—153 **9 Claims**

1. An azo dyestuff having the formula

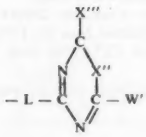


wherein X is a cellulose-reactive group selected from the class consisting of 5-chloro-6-methyl-2-methylsulphonyl-pyrimid-4-ylamino, 2,3-dichloroquinoxalin-6-ylcarbonylamino, β-(4,5-dichloropyridaz-6-on-1-yl)propionylamino, β-acetoxypropionylamino, acryloylamino, β-phenylsulphonylpropionylamino, 3,6-dichloropyridazin-4-ylcarbonylamino, 2,4-dichloropyrimid-6-ylamino, 2,6-dichloropyrimid-4-ylamino, 2,4-dichloropyrimid-5-ylcarbonylamino, 2,4,5-trichloropyrimid-6-ylamino, 2,5,6-trichloropyrimid-4-ylamino, 2,4-dichloro-5-bromopyrimid-6-ylamino, 2,6-dichloro-5-bromopyrimid-4-ylamino, 2,4-dichloro-5-cyanopyrimid-6-ylamino, 2,6-dichloro-5-cyanopyrimid-4-ylamino, 2,4-dichloropyrimid-5-ylsulphonylamino, 2-chlorobenzthiazol-6-ylcarbonylamino, 1,4-dichlorophthalazin-6-ylcarbonylamino, β-bromopropionylamino, 4-(4′,5′-dichloropyridaz-6on-1-yl)benzoylamino, 2,3-dibromopropionyl, tetrafluorocyclobutylcarbonylamino, trifluorocyclobutenylcarbonylamino, tetrafluorocyclobutylacryloylamino, trifluorocyclobutenylacryloylamino, 2,4-dichloroquinazolin-5-ylcarbonylamino, and s-triazinyl amino groups of the formula:

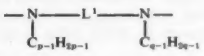


wherein X′ is selected from the class consisting of Cl, Br, SO_3H, benzthiazol-2-ylthio, N,N-diethyldithiocarbamyl, pyridinium-1-yl, trimethylammonium, diazabicyclooctaniumyl, N′,N′-dimethylhydraziniumyl, and N-methylpyrrolidinium-1-yl, and W is selected from the class consisting of Cl, Br, N,N-diethyldithiocarbamyl, lower alkoxy, lower alkoxy alkoxy, sulphophenoxy, NH_2, lower alkylamino, hydroxy-lower alkylamino, sulpho-lower alkylamino, lower alkoxy lower alkylamino, di(lower alkyl) amino, di(hydroxy lower alkyl) amino, morpholino, cyclohexylamino, benzylamino, hydrazi-

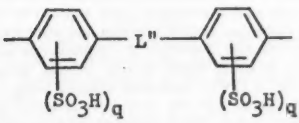
nyl, anilino, N-methylanilino, N-(sulphomethyl) anilino, sulphoanilino, disulphoanilino, sulphotoluidino, carboxyanilino, sulphocarboxyanilino, anisidino, methoxytoluidino, sulphoanisidino, sulphochloroanilino, N-methylsulphoanilino, sulphonaphthylamino, disulphonaphthylamino, trisulphonaphthylamino and diamine of the formula:



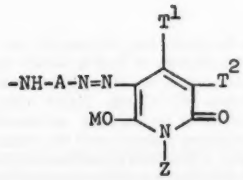
wherein L is selected from the class consisting of piperazinylene and



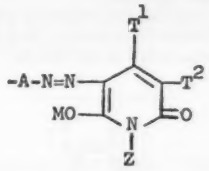
wherein p and q each independently represents 1 or 2 and L^1 is a direct link or a member selected from the class consisting of lower alkylene, phenylene, sulphophenylene, disulphophenylene, diphenylene, disulphodiphenylene, disulphonaphthylene and



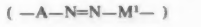
wherein L'' is NHCONH, CH=CH, OCH_2CH_2O, CH_2, SO_2 or O and q is 0 or 1, X'' is N, C-H, or C-Cl, X''' is Cl, or SO_3H, and W^1 is selected from the class consisting of lower alkoxy, sulphophenoxy, NH_2 lower alkylamino, Cl, lower (hydroxyalkyl) amino, anilino, N-methylanilino, sulphoanilino, disulphoanilino, N-methylsulphoanilino, sulphotoluidino, sulphocarboxyanilino, sulphonaphthylamino, disulphonaphthylamino, trisulphonaphthylamino, and



in which case both moieties of the formula:



are identical, Z is selected from lower alkyl, hydroxy lower alkyl, lower alkoxy lower alkyl, lower alkylamino lower alkyl, cyclohexyl, phenyl and anisyl, T^1 is selected from H, lower alkyl, phenyl, anisyl and amino, T^2 is selected from H, cyano, lower alkyl, aminocarbonyl, N-lower alkylaminocarbonyl, N-phenylaminocarbonyl, N,N-di(lower alkylamino carbonyl) and N-lower alkyl-N-phenylaminocarbonyl, M is selected from H, Co and Cr, and when M is H, A is selected from monosulphophenylene, disulphophenylene, sulphonaphthylene and



wherein A is monosulphophenylene or disulphophenylene and M^1 is monosulpho-1,4-naphthylene or 1,4-phenylene in which the benzene nucleus carries 0-2 substituents selected from CH_3 and CH_3O, and when M is Co or Cr, A is sulpho-hydroxyphenylene linked through the oxygen to M.

3,926,945

2,4-DICYANO BUTYLAMINO-SUBSTITUTED MONOAZO DYESTUFFS

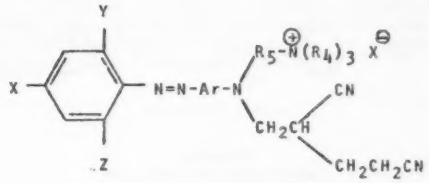
Stiles M. Roberts, Loudonville, and Lester N. Stanley, Delmar, both of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed May 16, 1972, Ser. No. 253,808

Int. Cl.² C09B *29/06, 29/08, 29/26*

U.S. Cl. 260—205 **4 Claims**

1. A dyestuff of the following formula:



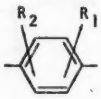
wherein

X is selected from the group consisting of NO_2, lower alkyl sulfonyl, CN, CF_3, lower carboalkoxy, sulfonamide, lower alkyl sulfonamide, di-lower alkyl sulfonamide, carboxamide, lower alkyl carboxamide and di-lower alkyl carboxamide;

Y is selected from the group consisting of H, Cl, Br and F or the same as X;

Z is selected from the group consisting of H, Cl, Br, F, CN, CF_3 and lower carbalkoxy;

Ar is bonded to the depicted diazo and adjacent N atom in para position and is selected from the group consisting of naphthyl and a radical of the formula:



wherein

R_1 and R_2 are independently selected from the group consisting of hydrogen, alkyl of 1–7 C atoms, alkoxy of 1–7 C atoms, Cl, Br, F, CF_3, R_3CONH- and R_3OCO- wherein R_3 is selected from the group consisting of alkyl of 1–7 C atoms and phenyl;

R_3 is a straight or branch chain alkylene group of 1–7 C atoms;

R_4 is alkyl of 1–5 C atoms or aralkyl of 7-14 C atoms; and

X^- is the cation of a mineral acid.

3,926,946

WATER SOLUBLE MONOAZO DYESTUFFS CONTAINING A DIPHENYLAMINE GROUP CARRYING A SULPHAMOYL SUBSTITUENT AND A SULPHO OR SULPHATO SUBSTITUENT

Denis Robert Annesley Ridyard, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

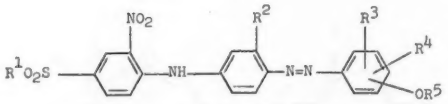
Filed Oct. 3, 1972, Ser. No. 294,608

Claims priority, application United Kingdom, Oct. 12, 1971, 47452/71

Int. Cl.² C07C *107/06*

U.S. Cl. 260—206 **2 Claims**

1. A water-soluble monoazo dyestuff having the formula:



wherein

R^1 represents hydroxyl, amino, mono(lower alkyl) amino, di(lower alkyl) amino, anilino or sulphatoethylamino,

R^2 represents hydrogen, sulphamoyl or sulpho,

R^3 represents hydrogen, chlorine, lower alkyl or lower alkoxy,

R^4 represents hydrogen or lower alkyl and

R^5 represents hydrogen, lower alkyl, acetyl, benzoyl or p-toluenesulphonyl, the $—OR^5$ group being in the 2- or 4-position relative to the azo group and substituents R^1 and R^2 being so chosen that the dyestuff contains only one sulphamoyl and only one of sulpho or sulphato.

3,926,947

CONTROLLED PYROLYSIS OF CELLULOSIC MATERIALS FOR PRODUCTION OF CHEMICALS

Anne E. Lipska, Palo Alto, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Continuation-in-part of Ser. No. 200,514, Nov. 19, 1971, abandoned. This application June 17, 1974, Ser. No. 480,107

Int. Cl.² C07H *3/08*

U.S. Cl. 260—209 R **3 Claims**

1. 1,5-anhydro-3,4-dideoxy-Δ^3-β-D-pyranosen-2-one.

3,926,948

ANTIBIOTICS DESTOMYCIN A AND B AND A METHOD FOR PRODUCING SAME USING STREPTOMYCES RIMOFACIENS

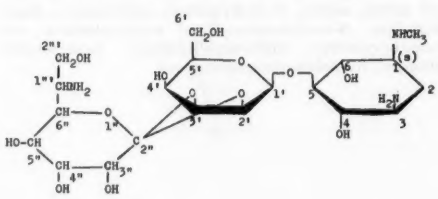
Shinichi Kondo, Yokohama; Masaji Sezaki; Makiko Koike, both of Tokyo; Masaru Shimura, Yokohama; Eiichi Akita, Tokyo; Kimio Satoh, Kawasaki; Kazuko Hamamoto, Kokubunji; Taro Niida, Yokohama, and Takeshi Hara, Tokyo, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Apr. 11, 1967, Ser. No. 630,084

Int. Cl.² A61K *35/00;* **C07H** *15/20*

U.S. Cl. 260—210 AB **9 Claims**

1. An antibiotic substance, destomycin A, effective in inhibiting the growth of Gram-positve bacteria, Gram-negative bacteria and molds, which is white powder, decomposes gradually at 180°– 190°C, the elemental analysis: C:44.70%, H:7.42%, N:7.73%, 0:39.41%, N—CH_3:3.06%, amino N:4.67, exhibits titration equivalent of 182 (in aqueous solution), exhibits $[\alpha]_D^{22} = +7°$ (C 2, in water), exhibits no characteristic absorption of ultraviolet absorption spectrum at 210 – 400 m μ but only end absorption, gives a positive reaction to ninhydrin, anthrone, ehrlich reaction and after hydrolsis red tetrazolium reaction, 5-methyl- β - naphthalene sulfonate of destromycin A being whitle needle crystals, being decomposed at 186° – 189°C, elemental analysis being C:51.67%, H:6.21%, N:3.52%, S:74.9%, 0:30.63%, N-acetyl destomycin A being white crystals, being decomposed gradually at 240° – 260°C, elemental analysis being C:46.36%, H:7.11%, N:6.14%, 0:39.39%, the chemical structure of destomycin A being 5-0-[2′, 3′-0-[3″, 4″, 5″-trihydroxy-6″-(1‴-amino-2‴-hydroxymethyl)-tetrahydropyran-2″-ylidene] β -D-talopyranoryl]-1-methylamino-3-amino-1,2,3 -trideoxy-myoinositol ($C_{20}H_{37}N_3O_{13}.H_2O$).



3. A process for producing a biologically active substance, identified as destomycins A and B, which comprises cultivating a destomycins A and B-producing strain of *Streptomyces rimofaciens* ATCC No. 21066 under submerged aerobic conditions in an aqueous carbohydrate solution containing nitrogenous nutrient until the substantial amount of said antibiotics is produced in said medium and recovering destomycins A and B thus produced from the cultured broth.

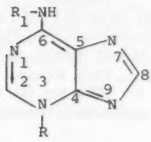
3,926,949

CYTOKININ-3-NUCLEOSIDE COMPOUNDS

J. Eugene Fox, and James D. McChesney, both of Lawrence, Kans., assignors to Kansas University Endowment Association, Lawrence, Kans.

Filed Sept. 9, 1974, Ser. No. 504,267
Int. Cl.² C07H 19/16
U.S. Cl. 260—211.5 R 10 Claims

1. A novel cytokinin-3-nucleoside compound of the formula:



wherein R_1 represents a member selected from the group consisting of $—CH_2—C_6H_5$, $—C_2H_4—C_6H_5$, and $—CH_2Y$, wherein Y represents a member selected from the group consisting of furfuryl, pyridyl, thiophene, C_5–C_7 cycloalkyl, and C_5–C_7 cycloalkenyl, and $—CH_2—C_6H_4—X$, wherein X represents a member selected from the group consisting of alkyl of from one to three carbon atoms, a branched alkyl of three carbon atoms, an alkenyl of from one to three carbon atoms, a branched alkenyl of three carbon atoms, halogen, and CF_3; and wherein R represents a monosaccharide.

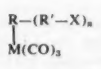
3,926,950

METHOD FOR REACTING ORGANIC HALIDES

Michael F. Farona, Cuyahoga Falls, and James F. White, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio

Division of Ser. No. 339,637, March 9, 1973, Pat. No. 3,832,403, which is a continuation-in-part of Ser. No. 119,908, March 1, 1971, abandoned. This application Apr. 10, 1974, Ser. No. 459,481
Int. Cl.² C08G 61/02
U.S. Cl. 260—2 H 8 Claims

1. The polymerization of an aromatic substrate monomer to form a branched polymer comprising the steps of: charging a reaction vessel with a metallic hexacarbonyl compound having the general formula $M(CO)_6$ where M is selected from the group consisting of Cr, Mo and W, adding aromatic substrate monomers having the general formula $R—(R'—X)_n$ wherein R is an aryl radical and R′ is selected from the group consisting of alkyl groups having from one to about six carbon atoms, alkoxide groups having from one to about four carbon atoms, and haloalkyl, and X is selected from the group consisting of bromine, chlorine and fluorine, and *n* is an integer from 1 to 5, reacting said metallic hexacarbonyl compound with part of said aromatic substrate monomer to yield an arene metal tricarbonyl catalyst having the general formula



heating said reaction vessel from ambient temperatures to a temperature sufficient to cause said catalyst to polymerize said aromatic substrate monomers by removing the halide from said aromatic substrate monomers to form active aromatic substrate monomers having a carbonium ion which said active monomers initiate and continue said polymerization to form the branched polymers.

3,926,951

NONIONIC CELLULOSE ETHERS

Sven Georg Lindenfors, and Sven-Olof Johan Westberg, both of Domsjoverken, Sweden, assignors to MoDoKemi AB, Stenungsund, Sweden

Filed Mar. 11, 1974, Ser. No. 450,132
Claims priority, application Sweden, Mar. 14, 1973, 7303582
Int. Cl.² C08B 11/193
U.S. Cl. 260—231 A 14 Claims

1. Nonionic cellulose ethers having attached to the cellulose molecule hydroxyethyl groups in a molecular substitution within the range from about 0.1 to about 2.5, hydroxyalkyl groups selected from the group consisting of hydroxypropyl and hydroxybutyl in a molecular substitution within the range from about 0.1 to about 4, and alkyl groups having from 2 to 4 carbon atoms in a degree of substitution within the range from about 0.05 to about 1.5.

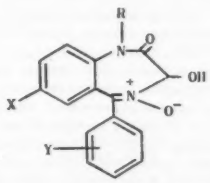
3,926,952

1,4-BENZODIAZEPIN-2-ONES AND THEIR SYNTHESIS

Ronald J. McCaully, Malvern, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 294,724, Oct. 3, 1972, Pat. No. 3,873,604. This application Jan. 30, 1974, Ser. No. 438,115
Int. Cl.² C07D 243/26, 243/28
U.S. Cl. 260—239.3 D 6 Claims

1. A compound of the formula



wherein R is hydrogen, or alkyl of from 1 to 6 carbon atoms, and X and Y may be the same or different and are selected from the group consisting of hydrogen, halogen, nitro, trifluoromethyl, thiomethyl, cyano, alkyl of from 1 to 6 carbon atoms, and alkoxy of from 1 to 6 carbon atoms.

3,926,953

PROCESS FOR PRODUCING 1,5-DIACETYL-3,7-DINITRO-1,3,5,7-TETRAAZACYCLOOCTANE

Michael D. Coburn, Los Alamos, and Theodore M. Benziger, Santa Fe, both of N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 5, 1974, Ser. No. 529,988
Int. Cl.² C07D 257/02
U.S. Cl. 260—239 BC 4 Claims

1. In a method for preparing 1,5-diacetyl-3,7-dinitro-1,3,5,7-tetraazacyclooctane by the nitrolysis in mixed HNO-

$_3$—H_2SO_4 of diacetyl pentamethylenetetramine in solution in acetic acid, the improvement comprising the addition of urea to said acetic acid solution of diacetyl pentamethylenetetramine before said nitrolysis.

3,926,954

PREPARATION OF SALTS OF CARBOXYLIC ACIDS CONTAINING A BETA-LACTAM GROUP

Erwin Kiesewetter, Obere Donnerbergstr. 57, and Siegfried Herrling, Auf der Liester 8, both of 519 Stolberg, Rhld., Germany

Filed May 27, 1971, Ser. No. 147,677
Int. Cl.[2] C07D *499/16*
U.S. Cl. 260—239.1 29 Claims

1. In the process for preparing a sodium, potassium or calcium salt of a penicillin, a cephalosporin, a 6-aminopenicillanic acid, wherein there is reacted a silyl derivative of the penicillin, the cephalosporin, or the 6-aminopenicillanic acid in which derivative at least the carboxyl group is linked, through the silicium atom, to a trimethylsilyl or a dimethylsilyl group, the improvement which comprises using as a reactant a salt which is a member of the group consisting of a sodium, a potassium or a calcium salt of 2-ethyl-hexanoic acid, butyric acid, alpha-ethyl-butyric acid, isobutyric acid, dimethylmalonic acid, isoamyl ethyl acetic acid phenyl acetic acid, ethanol, of a propanol, a butanol, an amylalcohol, of phenol, trimethylsilanol or of triphenylsilanol, and forming said salt directly from said silyl derivative, without intermediate saponification of the ester to the free acid.

2. In the process of claim 1 for preparing a sodium, potassium or calcium salt of a penicillin, selected from the group consisting of alpha-phenoxy-acetyl-, alpha-phenoxypropionyl-, alpha-phenoxybutyryl-, phenylacetyl-, alpha-amino phenyl acetyl-, 1-amino-cyclohexan-1-carbonyl-, alpha-amino-thienylacetyl-, alpha-guanylureido-phenylacetyl- and alphacarboxy-thienylacetyl-6-amino-penicillanic acid, where there is reacted under anhydrous conditions, a silyl derivative of said penicillin in which derivative at least the carboxyl group is linked through the silicium atom to a trimethylsilyl or a dimethylsilyl group, the improvement which comprises using as a reactant a salt which is a member of the group consisting of a sodium, a potassium or a calcium salt of 2-ethylhexanoic acid, butyric acid, alpha-ethyl-butyric acid, isobutyric acid, dimethylmalonic acid, isoamyl ethyl acetic acid phenyl acetic acid, ethanol, of a propanol, a butanol, an amylalcohol, of phenol, trimethylsilanol or of triphenylsilanol and forming said penicillin salt directly from said silyl derivative.

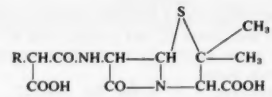
3,926,955

CARBENICILLIN ANALOGUES

George Burton, Coulsdon; John Sydney Davies, Reigate, and Ann Frances Hubbard, Redhill, all of England, assignors to Beecham Group Limited, United Kingdom

Filed Sept. 25, 1972, Ser. No. 291,798
Claims priority, application United Kingdom, Oct. 8, 1971, 46929/71
Int. Cl.[2] C07D *499/46*
U.S. Cl. 260—239.1 5 Claims

1. A penicillin of formula (1):-



(I)

or a non-toxic salt or non toxic ester which is hydrolyzable in vivo to the free acid, thereof, in which formula R is cyclopropyl.

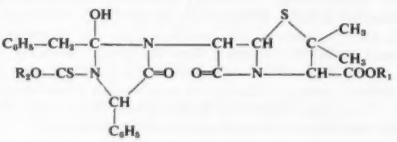
3,926,956

PROCESS FOR THE PREPARATION OF AMPICILLIN

Jean Bouchaudon, Morsang-sur-Orge; Pierre Le Roy, Thiais, and Mayer Naoum Messer, Bievres, all of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed Feb. 14, 1974, Ser. No. 442,430
Claims priority, application France, Feb. 16, 1973, 73.05667
Int. Cl.[2] C07D *499/04*
U.S. Cl. 260—239.1 10 Claims

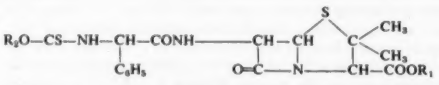
1. Process for the preparation of ampicillin which comprises contacting a penicillin G derivative of the formula:



wherein R_1 is a radical selected from the class consisting of benzyl, p-nitrobenzyl, 2,2,2-trichloroethyl, trityl, dimethylsilyl, trimethylsilyl, phenacyl, p-bromophenacyl, acetyl, propionyl, butyryl, benzoyl, succinyl, methanesulphonyl, p-toluenesulphonyl, methylphosphinyl, methoxyphosphinyl, dimethylphosphinyl, dimethoxyphosphinyl, chloroethoxyphosphinyl, dichloroethoxyphosphinyl, phenylphosphinyl, phenoxyphosphinyl, diphenylphosphinyl, diphenoxyphosphinyl, 4-methyl-1,3,2-dioxaphosphoranyl, 1,3,2-dioxaphosphiranyl and 1,3,2-benzodioxaphospholyl, and R_2 is a group of the formula:

$$Y_{3-n}CH_n—CH(R)—$$

wherein Y is halogen, *n* is zero, 1 or 2, and R is hydrogen or phenyl, with an inorganic or organic base to open the imidazolidine ring and give an intermediate product of the formula:



wherein R_1 and R_2 are as hereinbefore defined, and removing the groups —R_1 and R_2O—CS— which protect the carboxy radical and amine functions respectively to yield ampicillin.

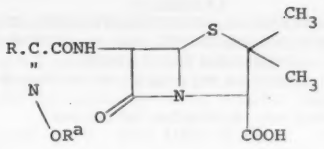
3,926,957

PENICILLIN ANTIBIOTICS

Michael Gregson, London; Martin Christopher Cook, and Gordon Ian Gregory, both of Chalfont St. Peter, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Division of Ser. No. 274,602, July 24, 1972, which is a continuation-in-part of Ser. No. 221,057, Jan. 26, 1972, abandoned. This application May 3, 1974, Ser. No. 466,780
Int. Cl.[2] C07D *499/44*
U.S. Cl. 260—239.1 2 Claims

1. A compound selected from the group consisting of a penicillin antibiotic of the formula



wherein R is furyl or furyl substituted by chloro, bromo, hydroxy, lower alkyl, nitro, amino, lower alkylamino, di(lower alkyl)amino, lower alkanoyl, lower alkanoylamido, lower alkoxy, lower alkylthio or carbamoyl; and R^a is hydrogen or

wherein R^c is C_1–C_4 alkyl, C_1–C_4 chloroalkyl, C_1–C_4 alkoxy, phenyl, nitrophenyl, C_1–C_4 alkylamino or C_1–C_4 chloroalkylamino; and a physiologically acceptable salt thereof, said penicillin antibiotic being in the form of the syn isomer free of the corresponding anti isomer to the extent of at least 75%.

3,926,958

PREPARATION OF PENICILLIN SALTS

Sidney Edward Callander, Worthing, England, assignor to Beecham Group Limited, England

Filed May 13, 1974, Ser. No. 469,679

Claims priority, application United Kingdom, May 15, 1973, 22982/73

Int. Cl.² C07D *499/44*

U.S. Cl. 260—239.1 **5 Claims**

1. A process for the preparation of a crystalline solvate of an alkali metal or alkaline earth metal salt of amoxycillin, which process comprises adding a source of alkali metal or alkaline earth metal cations selected from sodium, potassium, calcium or magnesium 2-ethylhexanoate, methoxide, iodide, phenoxide, thiocyanate or ethyl acetoacetate to a solution of amoxycillin or an ethylamine salt thereof, said solution containing a pharmaceutically acceptable amide of the formula $RCONR_1R_2$, wherein R is a hydrogen atom or a methyl group, and R_1 and R_2 are each a hydrogen atom or a methyl or ethyl group.

3,926,959

PENICILLINE DERIVATIVES

Kiyoaki Nitanai; Atsuo Okubo, and Hideo Yamazaki, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Chiyoda-ku, Tokyo, Japan

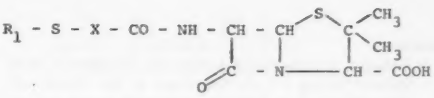
Filed May 16, 1974, Ser. No. 470,600

Claims priority, application Japan, May 21, 1973, 48-55580; May 21, 1973, 48-55582

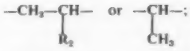
Int. Cl.² C07D *499/62*

U.S. Cl. 260—239.1 **5 Claims**

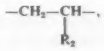
1. Penicillin derivatives of the general formula:



vherein: X is



R_1 is phenyl or benzyl R_2 is hydrogen or methyl, provided that when R_1 is benzyl and X is



R_2 is methyl; provided further, that when X is

R_1 is benzyl and nontoxic, pharmaceutically acceptable salts thereof.

3,926,960

PENICILLINS

Harry Ferres, Horsham; Adrian Victor Kemmenoe, Westcott, and Desmond John Best, Sutton, all of England, assignors to Beecham Group Limited, England

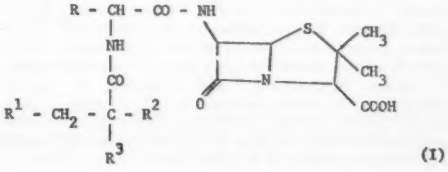
Division of Ser. No. 466,184, May 3, 1974. This application Jan. 22, 1975, Ser. No. 543,070

Claims priority, application United Kingdom, May 4, 1973, 21203/73

Int. Cl.² C07D *499/44*

U.S. Cl. 260—239.1 **9 Claims**

1. A penicillin of formula (I):



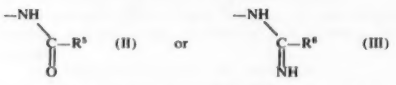
(I)

wherein

R is phenyl, hydroxyphenyl, halophenyl, nitrophenyl, alkoxyphenyl having 1–3 carbon atoms in the alkoxy part, aminophenyl, 2- or 3-thienyl, cycloalkyl having 3–7 carbon atoms in the cyclo part, cycloalkenyl having 5–7 carbon atoms in the cyclo part, or alkyl having 1–4 carbon atoms;

R^1 is hydrogen, methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, tert.-butyl, n-pentyl, methoxy, ethoxy, n-propoxy, isopropoxy, methylthio, ethylthio, n-propylthio, isopropylthio, methoxymethyl, methylthiomethyl, ethoxymethyl, n-propoxymethyl,

R^2 is



(II) or (III)

in which R^5 is amino, mono- or di-alkylamino having 1–4 carbon atoms in the alkyl part, cyclohexylamino, hydrogen, alkyl of 1–4 carbon atoms or phenyl, and R^6 is amino, mono- or di-alkylamino having 1–4 carbon atoms in the alkyl part or cyclohexylamino;

R^3 is hydrogen or alkyl of 1–3 carbon atoms; or a pharmaceutically acceptable salt or a pharmaceutically acceptable hydrolyzable ester which converts to the free acid form in vivo.

3,926,961
SULPHAMOYLBENZOIC ACID AMIDES

Pier Giorgio Ferrini, Binningen; Georges Haas, and Alberto Rossi, both of Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

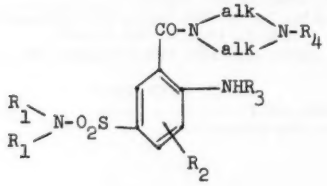
Filed June 27, 1974, Ser. No. 483,741

Claims priority, application Switzerland, July 10, 1973, 10019/73

Int. Cl.² C07D *237/00, 239/00, 251/00, 265/00*

U.S. Cl. 260—239.7 **17 Claims**

1. A 2-amino-5-sulphamoyl-benzoic acid amide of the formula



wherein R_1 denotes lower alkyl of 1–4 carbon atoms, R_2 denotes hydrogen, halogen, trifluoromethyl, lower alkyl of 1–4 carbon atoms or lower alkoxy of 1–4 carbon atoms, R_3 denotes hydrogen, hydroxyl or lower alkyl of 1–4 carbon atoms, R_4 denotes R_5-C_1-C_4-alkyl, R_5-C_2-C_4-alkenyl, R_5 denotes phenyl, phenyl monosubstituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen or trifluoromethyl, pyridyl or pyridyl monosubstituted by C_1–C_4-alkyl or C_1–C_4-alkoxy, and alk denotes 1,2-alkylene having up to 4 carbon atoms.

3,926,962
6α-CARBOXYMETHYL-17-HYDROXY-3-OXO-17α-PREGN-4-ENE-21-CARBOXYLIC ACID γ-LACTONE AND INTERMEDIATES THERETO

George R. Lenz, Glenview, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed July 15, 1974, Ser. No. 488,446

Int. Cl.² C07J *19/00*

U.S. Cl. 260—239.57 **6 Claims**

1. 6α-Carboxymethyl-17-hydroxy-3-oxo-17α-pregn4-ene-21-carboxylic acid γ-lactone.

3,926,963
NEW BENZOXAZOLYLSTILBENES AS OPTICAL BRIGHTENERS

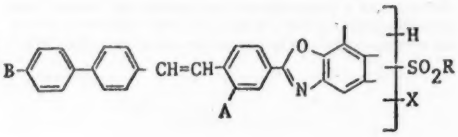
Hans Rudolf Meyer, Binningen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Apr. 20, 1973, Ser. No. 353,181

Int. Cl.² C09D *23/00*

U.S. Cl. 260—240 CA **4 Claims**

1. A benzoxazolylstilbene of the formula



wherein R denotes unsubstituted or non-chromophorically substituted alkyl with 1 to 18 carbon atoms, alkenyl with 2 to 4 carbon atoms, cycloalkyl, aryl or aralkyl, X denotes hydrogen, halogen or alkyl with 1 to 4 carbon atoms, A denotes hydrogen, sylphamyl or halogen and B denotes hydrogen, halogen, alkyl or alkoxy with 1 to 4 carbon atoms.

3,926,964
NEW OXAZOLE COMPOUNDS, PROCESS FOR THEIR MANUFACTURE, AND THEIR USE AS OPTICAL BRIGHTENERS FOR ORGANIC MATERIALS

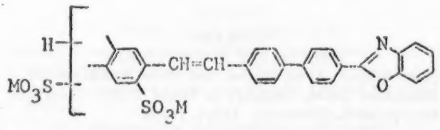
Peter Liechti, Arisdorf, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed July 30, 1973, Ser. No. 383,737

Int. Cl.² C07D *263/56*

U.S. Cl. 260—240 CA **2 Claims**

1. Oxazole compounds of the formula



wherein M represents hydrogen or a salt-forming cation.

3,926,965

PHTHALIMIDO DERIVATIVES AND PROCESSES

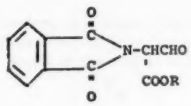
Narindar N. Girotra, Fords, and Norman L. Wendler, Summit, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 274,389, July 24, 1972, Pat. No. 3,840,534. This application Feb. 12, 1974, Ser. No. 441,779

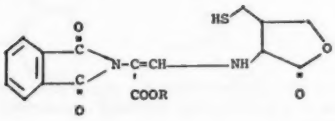
Int. Cl.[2] C09B *23/00*

U.S. Cl. 260—240 R 25 Claims

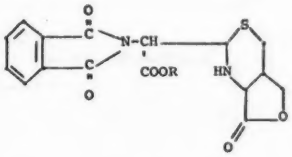
1. The process which comprises reacting a compound of the formula



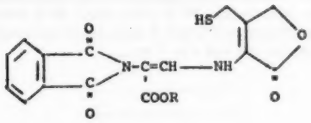
wherein R represents lower alkyl, with an acid salt of dihydro-3-amino-4-(mercaptomethyl)-2(3H)-furanone in the presence of a mild base to produce a mixture of the cis and trans isomers of



reacting said mixture with acid to produce a compound of the formula



and treating this product with N-halosuccinimide in the presence of base to produce



wherein R is the same as defined above.

3,926,966

5-NITROFURAN COMPOUNDS

Helmut Hagen, and Helmut Fleig, both of Frankenthal, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

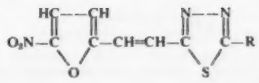
Filed June 6, 1974, Ser. No. 477,055

Claims priority, application Germany, June 9, 1973, 2329653

Int. Cl.[2] C07D *417/06*

U.S. Cl. 260—240 A 3 Claims

1. A 5-nitrofuran compound of the formula;



(I)

in which

R is alkyl of one to four carbon atoms.

3,926,967

2-(HETEROCYCLICMETHYLIDENEAMINO)BENZIMIDAZOLES AND DERIVATIVES THEREOF

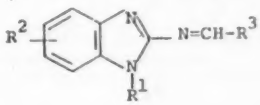
Rudiger D. Haugwitz, Titusville, and Venkatachala L. Narayanan, Hightstown, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 303,887, Nov. 6, 1972, abandoned. This application Oct. 7, 1974, Ser. No. 512,385

Int. Cl.[2] C07D *405/12, 405/14, 409/12*

U.S. Cl. 260—240 A 10 Claims

1. A compound of the formula



wherein R^1 is thiazoline or 5,6-dihydro-4H-1,3-thiazine; R^2 is hydrogen, nitro, or chloro; and R^3 is thienyl or furyl; and the pharmaceutically acceptable salts thereof.

3,926,968

SUBSTITUTED PYRAZOLO[4,3-C]PYRIDINE COMPOUNDS

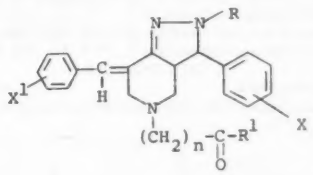
John Krapcho, Somerset, and Chester Frank Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 19, 1974, Ser. No. 525,148

Int. Cl.[2] C07D *471/02*

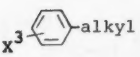
U.S. Cl. 260—240 R 11 Claims

1. A compound of the formula:



wherein R^1 is selected from the group consisting of alkyl of 1 to 4 carbons,

pyridyl, thienyl, and furyl; R is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbons, hydroxy-alkyl of 1 to 4 carbons, alkanoyl of 2 to 5 carbons, and



wherein alkyl is of 1 to 3 carbons; n is an integer from 1 to 4; X, X^1, X^2 and X^3 are independently selected from the group consisting of hydrogen, Cl, F, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, and CF_3; and the pharmaceutically acceptable acid-addition salts, N-oxides, and quaternary ammonium salts thereof.

3,926,969

TRIAZOLE-BIS(BENZOXAZOLE) OPTICAL BRIGHTENERS

Fritz Fleck, Bottmingen; Horst Schmid, Munchenstein, and Salvatore Valenti, Bottmingen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

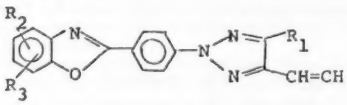
Filed Nov. 19, 1973, Ser. No. 417,373

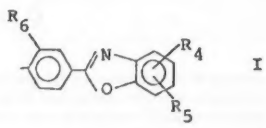
Claims priority, application Switzerland, Nov. 24, 1972, 17180/72; Dec. 18, 1972, 18381/72

Int. Cl.² C07D *413/14*

U.S. Cl. 260—240.1 **26 Claims**

1. A compound of formula I,





I

in which R_1 is a hydrogen or chlorine atom or a (C_{1-6}) alkyl radical,

each of R_2 and R_4, which may be the same or different, is a hydrogen or a chlorine atom, a cyano group, a (C_{1-12}) alkyl, phenyl, phenyl (C_{1-6}) alkyl, benzyloxy, phenoxy, (C_{1-6}) alkoxy or a naphthotriazolyl-2 radical, and

each of R_3 and R_5, which may be the same or different, is a hydrogen atom, a cyano group or a (C_{1-12}) alkyl or (C_{1-6}) alkoxy radical,

or, R_2 and R_3 together, and/or

R_4 and R_5 together, form a benzene ring, and

R_6 is a hydrogen atom or a cyano group.

3,926,970

MEROCARBOCYANINE FILTER DYES

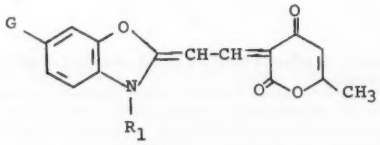
Frederick J. Sauter, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 266,028, June 26, 1972, Pat. No. 3,840,375. This application May 7, 1973, Ser. No. 357,961

Int. Cl.² C09D *23/10*

U.S. Cl. 260—240.4 **10 Claims**

1. A merocyanine filter dye selected from those having the formula



wherein R_1 represents a lower alkyl, phenyl, methylphenyl, chlorophenyl, cyanoalkyl, or acylalkyl group and G represents hydrogen or a sulfamoyl group, with at least one of the groups R_1 and G being a cyanoalkyl, acylalkyl, or sulfamoyl group.

3,926,971

NOVEL CHEMICAL SYNTHESIS

Alan L. Borror, Lexington; Ruth Linda Hill, Cambridge, and Paulina P. Garcia, Arlington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

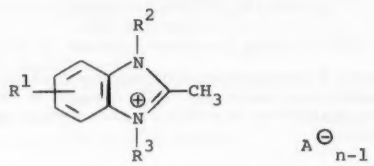
Filed May 22, 1974, Ser. No. 472,273

Int. Cl.² C07D *233/24*, *417/06*, *421/06*

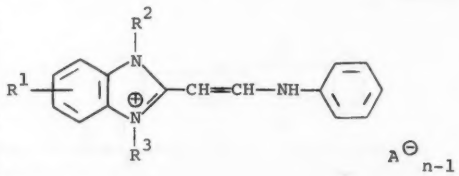
U.S. Cl. 260—240.6 **9 Claims**

1. A method which comprises:

condensing a benzimidazolium salt of the formula:



with an alkyl isoformanilide in a glycol ether medium to form a 2-β-anilinovinyl derivative represented by the formula:



wherein R^1 represents hydrogen or one or more cyanine dye nuclear substituents; R^2 is lower alkyl; R^3 is lower alkyl, carboxyalkyl or sulfoalkyl; A is an anion customary in the cyanine dye art; and *n* is 1 or 2.

3,926,972

7-HYDRAZONO AND HYDRAZINO CEPHALOSPORINS

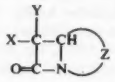
Gordon Lowe, Abingdon, England, assignor to National Research Development Corporation, England

Filed Feb. 5, 1973, Ser. No. 329,875

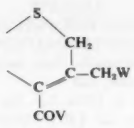
Int. Cl.² C07D *501/18*, *499/42*

U.S. Cl. 260—243 C **12 Claims**

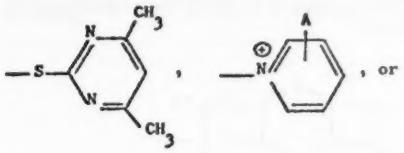
1. A compound of the formula



wherein X and Y together are hydrazono or X is hydrazino, Y is hydrogen, and Z is a group of the formula



in which COV is carboxy or a lower alkyl, halo(lower alkyl) or aralkyl ester thereof and W is hydrogen, a free hydroxy group, an acetoxy group, or the residue of the nucleophile of the formula



and A is hydrogen or a fused benzo group, or COV and W together are a lactone or a lactam group, the sulphur atom being bonded to the carbon rather than the nitrogen atom of the 2-azetidone ring, or a metallic salt thereof.

3,926,973

METHOD FOR SEPARATING CEPHALOSPORIN C

Kiyoshi Nara, Kyoto; Kazuhiko Ohta, Ikeda; Kazuyoshi Katamoto, Suita; Nariakira Mizokami, Suita, and Hideo Fukuda, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Mar. 2, 1973, Ser. No. 337,473

Claims priority, application Japan, Mar. 2, 1972, 47-22157

Int. Cl.² C07D *501/12*

U.S. Cl. 260—243 C **11 Claims**

1. In a method for separating cephalosporin C from a culture broth of a cephalosporin C-producing microrganism or its processed fluid containing cephalosporin C, the improvement which comprises contacting said broth or processed fluid containing cephalosporin C with activated carbon to allow cephalosporin C to be adsorbed on the carbon and subjecting the carbon to fractional elution with a mixture of water and a hydrophilic organic solvent adjusted to a pH of from about 7.5 to about 13.0 to collect fractions containing cephalosporin C.

3,926,974

CEPHALOSPORIN DERIVATIVES

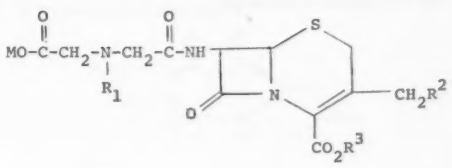
Abraham Nudelman, Bala Cynwyd, and Ronald J. McCaully, Malvern, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed May 24, 1973, Ser. No. 363,469

Int. Cl.² C07D *501/20*

U.S. Cl. 260—243 C **3 Claims**

1. A compound selected from the group consisting of



II

wherein M is selected from the group consisting of hydrogen and a pharmaceutically acceptable cation;

R^1 is selected from the group consisting of lower alkyl, phenyl and naphthyl;

R^2 is selected from the group consisting of hydrogen, hydroxyl, (lower)alkanoyloxy, benzoyloxy, and pyridinyl

R^3 is selected from the group consisting of hydrogen and a pharmaceutically acceptable cation.

3,926,975

CYCLIC IMIDES OF 3-SUBSTITUTED 2,4,6-TRIIODOANILINES

James H. Ackerman, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

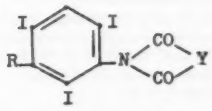
Division of Ser. No. 181,248, Sept. 16, 1971, Pat. No. 3,780,041, which is a continuation-in-part of Ser. No. 841,604, July 14, 1969, Pat. No. 3,660,408, which is a continuation-in-part of Ser. No. 715,583, March 25, 1968, abandoned. This application May 29, 1973, Ser. No. 364,290

Claims priority, application Canada, Mar. 18, 1969, 046086

Int. Cl. C07d *87/34, 93/10*

U.S. Cl. 260—243 B **4 Claims**

1. A compound of the formula



wherein Y is a 1,3-propylene group wherein the 2-carbon atom is replaced by O, S, SO or SO_2; and R is (lower-alkanoyl)NH, (lower-alkanoyl)$NHCH_2$, (lower-alkanoyl)N(-lower-alkyl), (lower-alkoxy-lower-alkanoyl)NH, or (lower-alkoxy-lower-alkanoyl)N(lower-alkyl).

3,926,976
3,4-DIHYDRO-1,2,3-OXATHIAZINE-4-ONES AND A PROCESS FOR THEIR PREPARATION

Karl Clauss, Eppenhain, Taunus; Harald Jensen, and Erich Luck, both of Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

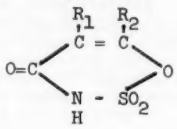
Filed June 7, 1973, Ser. No. 367,888

Claims priority, application Germany, June 10, 1972, 2228423

Int. Cl.² C07D 291/06

U.S. Cl. 260—243 R 5 Claims

4. A compound of the formula



wherein R_1 is hydrogen, alkyl having 1 to 10 carbon atoms, or aromatic hydrocarbon having up to 10 carbon atoms, and R_2 is hydrogen.

3,926,977
1,2,4-BENZOTHIADIAZINES

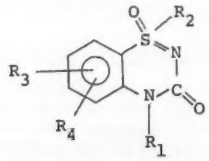
Francis Alexander Sowinski, Edison, N.J., and B. Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 31, 1973, Ser. No. 411,547

Int. Cl.² C07D 285/22

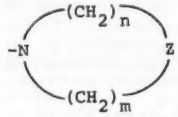
U.S. Cl. 260—243 D 11 Claims

1. A compound having the structure:



wherein

R_1 is lower alkyl, amino-lower alkyl, mono- or di-lower alkyl amino-lower alkyl, or imino-lower alkyl wherein the imino group has the formula:



wherein Z is oxygen, >CH-R_3 or >N-R_6, n is 2 or 3, m is 2 or 3, R_5 is hydrogen, phenyl, or benzyl and R_6 is hydrogen, lower alkyl, phenyl, or phenyl substituted with halogen, lower alkyl, lower alkoxy, or trifluoromethyl;

R_2 is phenyl or phenyl substituted with halogen, nitro, trifluoromethyl, lower alkyl or lower alkoxy;

R_3 is hydrogen, halogen, nitro, cyano, trifluoromethyl, lower alkyl or lower alkoxy; and

R_4 is hydrogen, or 8n

where R_7 is hydrogen or lower alkyl; and pharmaceutically acceptable acid-addition salts thereof.

3,926,978
PROCESS FOR PREPARING 3-FLUOROCEPHALOSPORINS

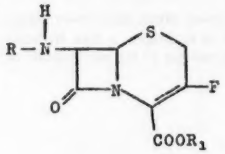
Gary A. Koppel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 6, 1974, Ser. No. 439,206

Int. Cl.² C07D 501/20

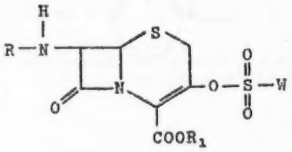
U.S. Cl. 260—243 C 11 Claims

1. A process for preparing a compound of the formula



(I)

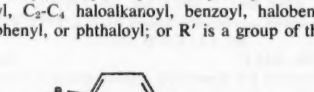
which comprises the step of reacting under substantially anhydrous conditions a 3-sulfonate ester cephalosporin of the formula



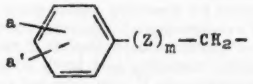
(II)

with an inorganic fluoride of the formula M^+F^- in which M is potassium, sodium, or silver in the presence of an 18-crown-6 ether and an inert solvent selected from the group consisting of a nitrile and a nitroalkane at a temperature of from about −20° C. to about +25° C., in which, in the above formulae, W is C_1-C_6 alkyl, phenyl, tolyl, halophenyl, or nitrophenyl, R is an acyl group derived from a carboxylic acid and represented by the formula

wherein R′ is C_1-C_6 alkyl, C_1-C_3 haloalkyl, C_1-C_3 cyanoalkyl, phenyl, methylphenyl, hydroxyphenyl, halophenyl, nitrophenyl, methoxyphenyl, or a 5-substituted-amino-5-carboxybutyl ester group of the formula



wherein A is diphenylmethyl, p-nitrobenzyl, benzyl, 2,2,2-trichloroethyl, t-butyl, or p-methoxybenzyl and A′ is C_2-C_4 alkanoyl, C_2-C_4 haloalkanoyl, benzoyl, halobenzoyl, 2,4-dinitrophenyl, or phthaloyl; or R′ is a group of the formula



wherein a and a. independently are hydrogen, C_1-C_4 lower alkyl, C_1-C_4 lower alkoxy, halogen, hydroxy, or nitro; Z is 0 or S; and m is 0 or 1; or R′ is a group of the formula

wherein P is 2-thienyl, 3-thienyl, or a phenyl group of the formula

wherein *a* and *a'* are as defined above, Q is hydroxyl, formyloxy, acetoxy, or protected amino; or R' is a group of the formula

wherein R'' is 2-thienyl, 3-thienyl, 2-furyl, 2-oxazyl, 2-thiazyl, or 1-tetrazyl; and R_1 is benzyl, *p*-methoxybenzyl, *p*-nitrobenzyl, diphenylmethyl, 2,2,2-trichloroethyl, or *t*-butyl.

3,926,979

DITHIOCARBONYLTHIOACETYL CEPHALOSPORINS

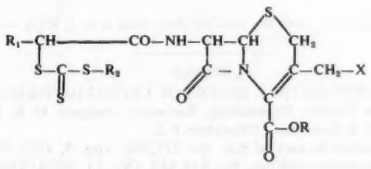
Uwe D. Treuner, Regensburg, and Hermann Breuer, Burgweinting, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 272,228, July 17, 1972, Pat. No. 3,846,418, which is a continuation-in-part of Ser. No. 180,523, Sept. 14, 1971, abandoned. This application Apr. 29, 1974, Ser. No. 465,013

Int. Cl.[2] C07D *501/28;* A61K *31/545*

U.S. Cl. 260—243 C 8 Claims

1. A compound of the formula



wherein R is hydrogen, lower alkyl, trimethylsilyl, alkali metal or

R_1 is hydrogen, lower alkyl or C_4–C_6 cyclolower alkyl; R_2 is aluminum, alkali metal or alkaline earth metal, lower alkyl or C_5–C_6 cyclo-lower alkyl; R_3 is lower alkyl or phenyl-lower alkyl; and X is hydrogen, hydroxy or lower alkanoyloxy.

3,926,980

DITHIOCARBONYLTHIOACETYL CEPHALOSPORINS

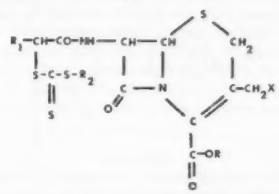
Uwe D. Treuner, Regensburg, and Hermann Breuer, Burgweinting, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 272,228, July 17, 1972, Pat. No. 3,846,418, which is a continuation-in-part of Ser. No. 180,523, Sept. 14, 1971, abandoned. This application May 24, 1974, Ser. No. 473,123

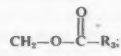
Int. Cl.[2] C07D *501/34;* A61K *31/545*

U.S. Cl. 260—243 C 6 Claims

1. A compound of the formula



wherein R is hydrogen, lower alkyl, trimethylsilyl, alkali metal or



R_1 is thienyl; R_2 is lower alkyl; R_3 is lower alkyl or phenyl-lower alkyl; and X is hydrogen, hydroxy or lower alkanoyloxy.

3,926,981

PROCESS FOR PREPARING 3,4-DIHYDRO-1,2,3-OXATHIAZINE-4-ONES

Karl Clauss, Rossert; Horst Schnabel, Steinbach, Taunus, and Harald Jensen, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt (Main), Germany

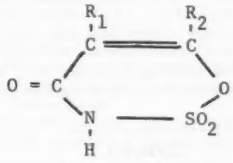
Filed May 30, 1974, Ser. No. 474,658

Claims priority, application Germany, June 1, 1973, 2327804

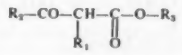
Int. Cl.[2] C07D *291/06*

U.S. Cl. 260—243 R 10 Claims

1. A process for preparing an oxathiazinone that is a 3,4-dihydro-1,2,3-oxathiazine-4-one of the formula



wherein R_1 is hydrogen or an alkyl of 1 to 4 carbon atoms and R_2 is an alkyl group of 1 to 4 carbon atoms, or a salt of said oxathiazinone, which comprises: reacting chlorosulfonylisocyanate and a β-ketocarboxylic acid-t-alkyl ester of the formula



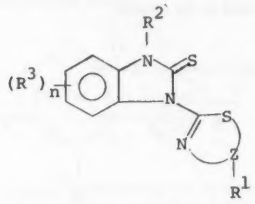
wherein R_3 is a tertiary alkyl of 4 to 10 carbon atoms, to form an addition product thereof; cleaving said addition product into CO_2, an alkene and β-ketocarboxylic acid amide-N-sulfochloride by heating at a temperature between about 40°C. and about 100°C.; and cyclizing said sulfochloride in an aprotic diluent by splitting off hydrogen chloride.

3,926,982
SUBSTITUTED BENZIMIDAZOLINETHIONES

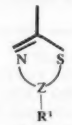
George Rovnyak, Hopewell; Venkatachala L. Narayanan, Hightstown; Rudiger D. Haughwitz, Titusville, and Christopher M. Cimarusti, Hamilton, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 3, 1974, Ser. No. 485,419
Int. Cl.² C07D 235/28
U.S. Cl. 260—243 R 11 Claims

1. A compound of the formula:



wherein Z is ethylene or propylene; R^1 is hydrogen, methyl, ethyl, phenyl, nitrophenyl, benzyl, phenethyl, tolyl, or xylyl; R^2 is hydrogen, alkyl of 1 to 5 carbons, benzyl, nitrobenzyl, phenethyl, nitrophenethyl, alkoxycarbonylalkylene wherein alkoxy is of 1 to 5 carbons and alkylene is of 1 to 3 carbons, dialkylaminoalkylene wherein each alkyl is of 1 to 3 carbons and alkylene is of 2 or 3 carbons, alkanoyl of from 2 to 18 carbons, benzoyl, substituted benzoyl wherein said substituent is halogen, alkyl of 1 to 3 carbons, or phenyl,



wherein R^1 and Z are as defined above,

or

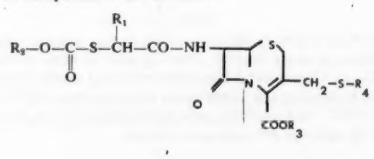
X is oxygen or sulfur; R^4 is alkyl of 1 to 3 carbons, phenyl, benzyl, or phenethyl; R^3 is hydrogen, halogen, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 3 carbons, alkoxy of 1 to 3 carbons, dialkylamino wherein each alkyl is of 1 to 3 carbons, alkanoyl of 2 to 6 carbons, or benzoyl; and n is one of two; and when R^2 is dialkylaminoalkylene or R^3 is amino or dialkylamino the pharmaceutically acceptable acid-addition salts.

3,926,983
3-HETEROTHIO[(ALKOXYCARBONYL)THIOACETYL]-CEPHALOSPORANIC DERIVATIVES

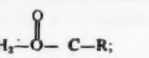
Uwe D. Treuner, and Hermann Breuer, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 30, 1974, Ser. No. 501,905
Int. Cl.² C07D 501/50; A61K 31/545
U.S. Cl. 260—243 C 10 Claims

1. A compound of the formula



wherein R_1 is hydrogen, lower alkyl, phenyl, thienyl, furyl or pyridyl; R_2 is lower alkyl, phenyl-lower alkyl or diphenylmethyl; R_3 is hydrogen, lower alkyl, phenyl-lower alkyl, diphenylmethyl, tri(lower alkyl)silyl, tri(lower alkyl)stannyl, alkali metal, alkaline earth metal, mono (lower alkyl-)amine salt, tri(lower alkyl)-amine salt or



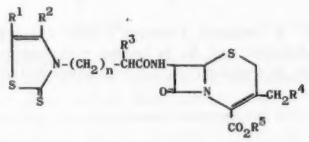
R_4 is R_5-isoxazole, R_5-isothiazole, R_5-oxadiazole, R_5-thiadiazole, R_5-tetrazole or R_5-1-oxopyridine; R_5 is hydrogen or lower alkyl; and R is lower alkyl, phenyl, phenyl-lower alkyl or diphenylmethyl; said lower alkyl groups having up to 8 carbon atoms.

3,926,984
7-[2-(2-THIOXO-4-THIAZOLIN-3-YL)-ACETAMIDO] CEPHALOSPORANIC ACID DERIVATIVES

Daniel M. Teller, Devon; John H. Sellstedt, Pottstown, and Charles J. Guinosso, King of Prussia, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 2, 1974, Ser. No. 511,155
Int. Cl.² C07D 501/34, 501/46
U.S. Cl. 260—243 C 13 Claims

1. A compound of the formula:

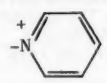


in which

R^1 and R^2 are independently —H or alkyl of 1 to 6 carbon atoms, and when taken together, R^1 and R^2 are trimethylene;

R^3 is —H, alkyl of 1 to 6 carbon atoms or methylthioethyl;

R^4 is —H, (lower)alkanoyloxy, or



,

R^5 is —H, an alkali metal or the ammonium ion;

and

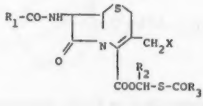
n is 0 or 1, with the proviso that when n is 1, R^3 is —H.

3,926,985
ACYLTHIOMETHYL ESTERS OF CEPHALOSPORINS

Hermann Breuer, Regensburg, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 277,700, Aug. 3, 1972, Pat. No. 3,860,591, and Ser. No. 516,566, Oct. 21, 1974. This application Nov. 25, 1974, Ser. No. 527,107
Int. Cl.² C07D 501/22, 501/24
U.S. Cl. 260—243 C 16 Claims

1. A compound of the formula



wherein R_1 is thienylmethyl or thienylmethyl bearing on the α-carbon hydroxy, amino, carboxy or ureido; R_2 is hydrogen

or lower alkyl; R_3 is lower alkyl; X is hydrogen, lower alkanoyloxy, lower alkylthio, thiadiazolylthio, (lower alkyl)-thiadiazolylthio, tetrazolylthio or (lower alkyl)tetrazolylthio, and acid addition salts of the basic members thereof.

3,926,986
TETRAHYDROOXAZINE DERIVATIVES

Albrecht Edenhofer, Riehen, Switzerland, assignor to Hoffman-La Roche Inc., Nutley, N.J.

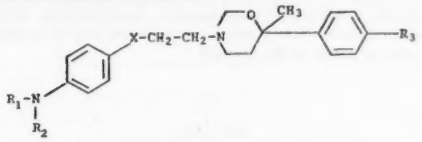
Division of Ser. No. 362,636, May 21, 1973, Pat. No. 3,879,405, which is a division of Ser. No. 148,119, May 28, 1971, Pat. No. 3,758,483. This application Jan. 13, 1975, Ser. No. 540,622

Claims priority, application Switzerland, June 19, 1970, 9318/70

Int. Cl.² C07D *87/00*

U.S. Cl. 260—244 **1 Claim**

1. A compound of the formula



wherein R_1 signifies hydrogen, lower alkyl, lower alkanoyl, lower alkylsulfonyl, C_3 to C_6 cycloalkyl or C_3 to C_6 cycloalkyl-lower alkyl; R_2 signifies hydrogen, lower alkyl, C_3 to C_6 cycloalkyl or C_3 to C_6 cycloalkyl-lower alkyl; R_3 signifies fluorine, chlorine or lower alkoxy; X signifies an oxygen atom or a sulfur atom.

3,926,987
DIOXAZINE DYES

Peter Dimroth, Ludwigshafen, and Volker Radtke, Frankenthal, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

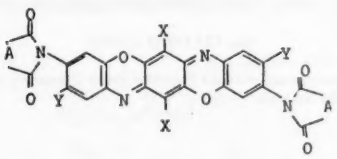
Filed Aug. 1, 1974, Ser. No. 493,780

Claims priority, application Germany, Aug. 24, 1973, 2342815

Int. Cl.² C07D *265/00, 273/00, 295/00*

U.S. Cl. 260—246 R **5 Claims**

1. A dioxazine dye of the formula



in which A is o-phenylene, o-phenylene substituted 1 to 4 times by chloro or bromo, or o-phenylene substituted once by phenyl, benzoyl or N-phenylcarbamoyl,

Y is methoxy or ethoxy and

X is chloro or bromo.

3,926,988
SUBSTITUTED PYRAZOLES

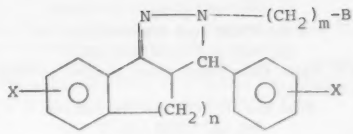
John Krapcho, Somerset, and Chester Frank Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 6, 1974, Ser. No. 467,047

Int. Cl.² C07D *231/54*

U.S. Cl. 260—247.5 EP **10 Claims**

1. A compound of the formula



wherein X is H, halogen, alkyl of from 1 to 3 carbons, alkoxy of from 1 to 3 carbons or CF_3, *n* is 1, 2 or 3, *m* is 2, 3 or 4, and B is lower alkylamino wherein the alkyl group has from 1 to 3 carbons, dilower alkylamino wherein each alkyl group has from 1 to 3 carbons, piperidino, pyrrolidino, morpholino, N-lower alkylpiperazino wherein the alkyl radical has from 1 to 3 carbons, or N-(2-hydroxyethyl)piperazino; and N-oxides and pharmaceutically acceptable acid-addition salts thereof.

3,926,989
PROCESS FOR THE PREPARATION OF ARYL-1,1,2,2-TETRAFLUOROETHYL ETHERS

Siegfried Rebsdat, Altotting, and Helmut Hahn, Burghausen, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 14, 1971, Ser. No. 152,600

Claims priority, application Germany, June 16, 1970, 2029556

Int. Cl.² C07C *41/06*

U.S. Cl. 260—247.7 C **9 Claims**

1. In a process for the preparation of an aryl-1, 1,2, 2-tetrafluoroethyl ether by reacting a phenol with tetrafluorethylene in an organic solvent in the presence of an alkaline catalyst at elevated temperatures, the improvement comprising reacting a phenolic compound selected from thee group consisting of phenol, naphthol and phenol substituted by 1 to 3 substituents selected from the group consisting of alkyl of 1 to 20 carbon atoms, alkoxy of 1 to 6 carbon atoms, hydroxy, formyl, amino, monoalkylamino of 1 to 4 carbon atoms, dialkylamino of 1 to 4 carbon atoms in each alkyl moiety, piperidino, morpholino and alkanoylamino of 1 to 5 carbon atoms in the alkane moiety, with tetrafluoroethylene in a water-miscible polar inert solvent with about 0.05 to about 0.5 mol of potassium hydroxide per each equivalent of phenolic hydroxy group at a temperature of about 50° to about 150°C and a pressure varying between atmospheric pressure and slightly subatmospheric pressure.

3,926,990
PROCESS FOR PREPARING AMIDE POLYPHOSPHATES

Kozo Fukuba; Yasutomo Ogushi, and Minematsu Miyazaki, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Oct. 15, 1973, Ser. No. 406,416

Claims priority, application Japan, Oct. 16, 1972, 47-103780

Int. Cl.² C07D *251/70;* **C07C** *127/00, 129/00*

U.S. Cl. 260—249.6 **6 Claims**

1. A process for preparing a substantially water insoluble amide polyphosphate which comprises heat-condensing together at least one phosphoric acid source selected from the group consisting of ammonium orthophosphate, urea phosphate, melamine phosphate, phosphoric anhydride, polyphosophoric acid and orthophosphoric acid and at least one cyanamide derivative as a nitrogen source selected from the group consisting of melamine, dicyanadiamide, guanidine and guanylurea in contact with a condensing agent selected from the group consisting of urea and urea phosphate and a mixture thereof in a molar ratio of urea/phosphoric acid (as H_3PO_4)/cyanamide derivative of 0.8 to 1.5/1/0.05 to 1 at a temperature of from 150° to 350°C for a period sufficient to provide the desired water insolubility to the amide polyphosphate product.

3,926,991
PROCESS FOR PRODUCING QUINOXALINE-DI-N-OXIDES

Donald E. Kuhla, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Mar. 7, 1973, Ser. No. 338,906
Int. Cl.² C07D 241/36
U.S. Cl. 260—250 Q **2 Claims**

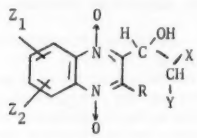
1. A process for the preparation of methyl-3-(2-quinoxalinylmethylene)carbazate-N¹,N⁴-dioxide which comprises the step of reacting methyl-3-(2-quinoxalinylmethylene)carbazate with about two equivalents of peracetic acid in a reaction inert solvent at a temperature of from about 20° up to 100°C. until reaction is substantially complete.

3,926,992
ALDOL PRODUCTS OF 2-QUINOXALINECARBOXALDEHYDE-1.4-DIOXIDES

James W. McFarland, Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Nov. 3, 1972, Ser. No. 303,490
Int. Cl.² C07D 241/52
U.S. Cl. 260—250 QN **10 Claims**

1. A compound of the formula



wherein

R is selected from the group consisting of hydrogen and methyl;

X is selected from the group consisting of —CN, —$COCH_3$, —$CONR_1R_2$, —$CONH—(CH_2)_n—R_3$ and —$COOR_4$;

Y is selected from the group consisting of hydrogen and X; each of R_1, R_2 and R_4 is selected from the group consisting of hydrogen, methyl and ethyl;

R_3 is selected from the group consisting of —OH and —$N(CH_3)_2$;

n is 2 or 3;

Z_1 is a 6- or 7-position substituent and is selected from the group consisting of H, —Cl, —CH_3—, OCH_2, —SO_2NH_2, —$SO_2NH(CH_3)$ and —$SO_2N(CH_3)_2$;

Z_2 is a 7- or 6-position substituent and is selected from the group consisting of H, —Cl and —CH_3;

with the proviso that when z_2 is —Cl or —CH_3, Z_1 is also —Cl or —CH_3;

and the pharmaceutically acceptable alkali metal, ammonium and amine salts of those compounds wherein at least one of X and Y is —COOH;

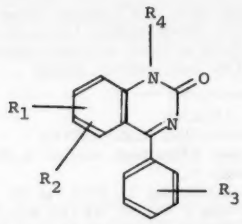
and the pharmaceutically acceptable acid addition salts of these compounds wherein R_3 is —$N(CH_3)_2$.

3,926,993
PROCESS FOR PRODUCTION OF QUINAZOLINE DERIVATIVES

Kikuo Ishizumi, Toyonaka; Kazuo Mori, Kobe; Michihiro Yamamoto, Nishinomiya; Masao Koshiba, Amagasaki; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

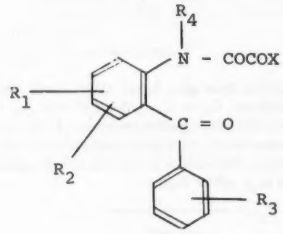
Filed Sept. 5, 1973, Ser. No. 394,542
Claims priority, application Japan, Sept. 7, 1972, 47-90225
Int. Cl.² C07D 239/82
U.S. Cl. 260—251 QB **4 Claims**

1. A process for preparing a quinazolinone of the formula,



[I]

wherein R_1, R_2 and R_3 are independently hydrogen, halogen, trifluoromethyl, nitro, lower alkylsulfonyl, lower alkyl, lower alkoxy or lower alkylthio; and R_4 is hydrogen, lower alkyl, phenyl C_1-C_3 alkyl, chlorobenzyl, fluorobenzyl, (C_2-C_3 alkanoyl) -C_1-C_4 alkyl, (C_1-C_4 alkoxy)C_1-C_4 alkyl, polyhalo C_1-C_3 alkyl, C_3-C_6 cycloalkyl, (C_3-C_6 cycloalkyl)C_1-C_4 alkyl, tetrahydrofurfuryl, tetrahydropyranylmethyl, pyridylmethyl, furylmethyl or thienylmethyl, which comprises the step of reacting an oxamyl halide of the formula,



[III]

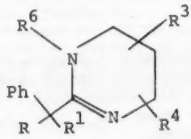
wherein R_1, R_2, R_3 and R_4 are as defined above; and X is a halogen atom, with sodium azide.

3,926,994
HETEROCYCLIC COMPOUNDS

Alan Chapman White, Windsor, and Robin Michael Black, Iver Heath, both of England, assignors to John Wyeth & Brother, Ltd., Taplow, England

Continuation-in-part of Ser. No. 309,580, Nov. 24, 1972, abandoned. This application May 23, 1974, Ser. No. 472,759
Claims priority, application United Kingdom, May 31, 1973, 26079/73
Int. Cl.² C07D 239/00
U.S. Cl. 260—251 R **5 Claims**

1. A compound selected from the group consisting of bases having the formula



and the pharmaceutically acceptable acid addition salts thereof wherein R^3 and R^4 which may be the same or different each represent a member of the group consisting of hydrogen, lower alkyl and hydroxy with the proviso that when one of R^3 and R^4 is hydroxy, the other of R^3 and R^4 is hydrogen, Ph represents a phenyl group optionally monosubstituted by lower alkyl, lower alkoxy, or halogen, R is a member of the group consisting of hydroxyl, lower alkanoyloxy, lower alkoxy and halogen, R^1 is a member of the group consisting of phenyl, halophenyl, lower alkoxyphenyl, lower alkylphenyl di-(lower

alkyl)phenyl and naphthyl and R^6 is a member of the group consisting of hydrogen, lower alkyl, and lower alkanoyl.

3,926,995
THEOPHYLLINE DERIVATIVES

Ferdinand Dengel, Wilhelmsfeld; Oskar Ehrmann, Mannheim; Ludwig Friedrich, Mannheim, and Frank Zimmermann, Mannheim, all of Germany, assignors to Knoll A.G. Chemische Fabriken, Ludwigshafen (Rhine), Germany

Filed Aug. 3, 1973, Ser. No. 385,320

Claims priority, application Germany, Aug. 8, 1972, 2239012

Int. Cl.² C07D *473/08*

U.S. Cl. 260—256 **2 Claims**

1. 7-[N-methyl-N-(β-3,4-dichlorophenylethyl)-3-aminopropyl]-theophylline.

3,926,996
PRODUCTION OF ANTHRAQUINONEOXAZOLES

Alfred Schuhmacher, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

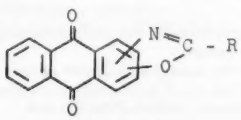
Filed Nov. 30, 1973, Ser. No. 420,702

Claims priority, application Germany, Dec. 4, 1972, 2259329

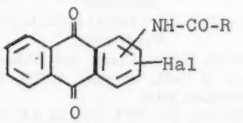
Int. Cl.² C07D *263/62*

U.S. Cl. 260—256.4 Q **9 Claims**

1. In a process for the production of an anthraquinoneoxazole of the formula:



in which R is 1-amino-anthraquinonyl-(2), 1-amino-4-nitroanthraquinonyl-(2), 1-anthraquinonyl, 2-anthraquinonyl or 1,9-anthrapyrimidyl-(2), by condensation of an o-haloacylaminoanthraquinone of the formula



in which Hal is chloro or bromo and the substituents —NH—CO—R and Hal are in the ortho-position to one another, at elevated temperature and in the presence of a salt of a weak acid with a strong base, said salt being selected from the group consisting of alkali metal carbonate, alkaline earth metal carbonate and alkali metal salts of formic acid, acetic acid and benzoic acid, the improvement which comprises:

carrying out the condensation in a water-miscible polar aprotic solvent selected from the group consisting of N,N-dimethylformamide, N,N-dimethylacetamide, N,N-dimethylpropionamide, N,N-diethylformamide, N,N-diethylacetamide, N,N-diethylpropionamide, N-methylpyrrolidone, N-methylcaprolactam, dimethyl sulfoxide, tetramethylene sulfone, or N,N,N′,N′-tetramethylurea.

3,926,997
2-ALKYLTHIO-4,6-BIS(SUBSTITUTED AMINO)-5-NITROPYRIMIDINES

Hanspeter Fischer, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

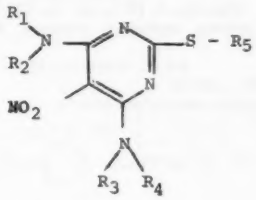
Continuation of Ser. No. 252,385, May 11, 1972, abandoned. This application Mar. 5, 1974, Ser. No. 448,301

Claims priority, application Switzerland, May 17, 1971, 7229/71

Int. Cl.² C07D *239/00*

U.S. Cl. 260—256.5 R **7 Claims**

1. A 5-nitropyrimidine of the formula:



wherein

R_1 represents alkyl having 2 to 6 carbon atoms; alkenyl or alkinyl having 3 to 5 carbon atoms; alkoxyalkyl, alkylaminoalkyl, or trialkyl ammonioalkyl having one to six carbon atoms in the alkyl groups thereof; hydroxyalkyl or cyanoalkyl having 1 to 4 carbon atoms; or cycloalkyl having 3 to 6 carbon atoms;

R_2 and R_3 each independently represent hydrogen, or lower alkyl;

R_4 represents hydrogen, lower alkyl, or cycloalkyl having 3 to 6 carbon atoms;

or R_3 and R_4 together with the adjacent nitrogen atom form a heterocycle selected from the group consisting of aziridino, pyrrolidino, piperidino, hexahydroazepino, piperazino, N-methylpiperazino, N-phenylpiperazino and morpholine; and

R_5 represents lower alkyl;

or an acid addition or quaternary ammonuim salt thereof.

3,926,998
O-ALKYL-O-PYRAZOLOPYRIMIDINE-THIONO-PHOSPHORIC ACID ESTER AMIDES

Reimer Cölln, Wuppertal, and Ingeborg Hammann, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

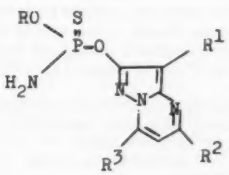
Filed Oct. 17, 1974, Ser. No. 515,795

Claims priority, application Germany, Oct. 23, 1973, 2352995

Int. Cl.² C07D *239/00*

U.S. Cl. 260—256.5 R **7 Claims**

1. An O-alkyl-O-pyrazolopyrimidine-thionophosphoric acid ester-amide of the formula



in which

R is alkyl with 1 to 6 carbon atoms,
R^1 is hydrogen or halogen, and
R^2 and R^3 each independently is hydrogen or methyl.

3,926,999

4-(PHENYL)-PIPERAZINO HALO ALKENONES AND ALKANONES

Eike Poetsch, Darmstadt, Germany, assignor to Merck Patent Gesellschaft Mit Beschraenkter Haftung, Darmstadt, Germany

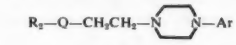
Filed Jan. 9, 1973, Ser. No. 322,184

Claims priority, application Germany, Jan. 15, 1972, 2201889

Int. Cl.² C07D *295/12*

U.S. Cl. 260—268 PH **14 Claims**

1. An arylpiperazine of the formula



wherein R_2 is H or alkyl of 1–4 carbon atoms; Q is $—CX_1=CH—CO—$, $—CH=CX_1—CO—$, $—CHX_1—CHX_1—CO—$, $—CO—CH=CX_1—$, $—CO—CX_1=CH—$ or $—CO—CHX_1—CHX_1—$, in which X_1 is Cl, Br or

wherein Ar is phenyl or phenyl substituted by one of alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, trifluoromethyl and halogen, or a physiologically acceptable acid addition salt thereof.

3,927,000

1(OR 3) PERFLUOROALKYL-3,4-DIHYDRO-2(1H)-ISOQUINOLINECARBONITRILES AND INTERMEDIATES

Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 282,266, Aug. 21, 1972, Pat. No. 3,855,288. This application Mar. 22, 1974, Ser. No. 453,592

Int. Cl.² C07D *217/02*

U.S. Cl. 260—283 R **8 Claims**

1. A compound selected from the group consisting of 1,2,3,4-tetrahydro-1-(pentafluoroethyl)isoquinoline, 1-(heptafluoropropyl)-1,2,3,4-tetrahydroisoquinoline and 1,2,3,4-tetrahydro-3-(trifluoromethyl)isoquinoline.

3,927,001

D-GLUCARO-1,5-LACTAM DERIVATIVES

Takashi Tsuruoka; Tomizo Niwa, both of Kawasaki; Uichi Shibata, Tokyo; Shigeharu Inouye, and Taro Nilda, both of Yokohama, all of Japan, assignors to Meiji Seika Company Ltd., Japan

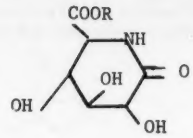
Filed Nov. 12, 1973, Ser. No. 414,628

Claims priority, application Japan, Nov. 17, 1972, 47-114735; Nov. 29, 1972, 47-118918

Int. Cl.² C07D *211/40*

U.S. Cl. 260—293.86 **5 Claims**

1. A D-glucaro-1,5-lactam ester represented by the structural formula,



wherein R is selected from the group consisting of methyl, ethyl, n-propyl and n-butyl.

3,927,002

N-(PYRIDYL)-N'-ALKYL-N'-(2-ALKOXYCARBONYL-BENZENESULFONYL)-GLYCINEAMIDES AND DERIVATIVES

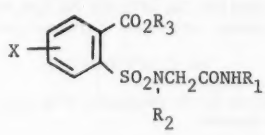
Joseph G. Lombardino, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 353,607, April 23, 1973, Pat. No. 3,853,862. This application Apr. 19, 1974, Ser. No. 462,212

Int. Cl.² C07D *213/56*

U.S. Cl. 260—294.8 F **4 Claims**

1. A compound of the formula



wherein R_1 is selected from the group consisting of 2-pyridyl and 6-methyl-2-pyridyl;
R_2 is alkyl having from 1 to 3 carbon atoms;
X is selected from the group consisting of hydrogen, methyl, methoxy, fluoro, chloro and bromo and
R_3 is alkyl having from 1 to 3 carbon atoms.

3,927,003

6-HYDRAZINO-2,3,5-TRIHALO-4-ALKYLTHIO PYRIDINES

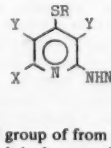
Sven H. Ruetman, Walnut Creek, and Richard N. Watson, Antioch, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 27, 1974, Ser. No. 536,790

Int. Cl.² C07D *213/77*

U.S. Cl. 260—294.8 G **4 Claims**

1. A 6-hydrazino-2,3,5-trihalo-4-(alkylthio)pyridine of the formula



wherein R is an alkyl group of from one to five carbons; X is Cl or Br; and Y, which is the same in each occurrence, is Cl or Br, except that Y cannot be Br when X is Cl.

3,927,004
SUBSTITUTED PYRIDINE PHOSPHONOTHIOATES

Chester E. Pawloski, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 1, 1974, Ser. No. 457,023
Int. Cl.² C07D *213/56*
U.S. Cl. 260—294.8 K **10 Claims**

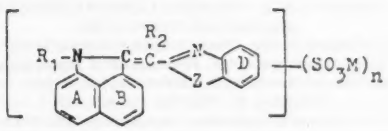
1. A compound selected from the group consisting of 0-(3,5-dichloro-6-propoxy-2-pyridinyl) 0-methyl phenylphosphonothioate; 0-(6-methyl-2-pyridinyl) 0-methyl phenylphosphonothioate, 0-(5-methyl-2-pyridinyl) 0-methyl phenylphosphonothioate, 0-(5-chloro-3-methyl-2-pyridinyl) 0-methyl phenylphosphonothioate and 0-(6-chloro-2-pyridinyl) P-phenyl N-methylphosphonamidothioate.

3,927,005
NAPHTHOLACTAM DYESTUFFS

Horst Harnisch, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Feb. 27, 1974, Ser. No. 446,479
Claims priority, application Germany, Feb. 27, 1973, 2309612; Nov. 17, 1973, 2357442
Int. Cl.² C07D *263/56, 277/64*
U.S. Cl. 260—294.8 B **3 Claims**

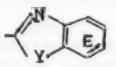
1. Naphtholactam dyestuffs of the formula



wherein

R_1 = hydrogen, C_1–C_4-alkyl, allyl, cyclohexyl, benzyl, phenethyl, phenyl, or C_1–C_4-alkyl substituted by C_1–C_4-alkoxy, chloro, bromo, cyano, carboxyl, carbo-C_1–C_4-alkoxy, sulfo; carbonamido, or acetoxy;

R_2 = COOM, CN, $CONH_2$, $COOR_7$, SO_2R_4, or



;

R_4 = C_1–C_4-alkyl, benzyl, phenethyl, or phenyl substituted by C_1–C_4-alkyl, halogen or C_1–C_4-alkoxy;

R_7 = C_1–C_3-alkyl, phenyl-C_1–C_3-alkyl, or C_1–C_3-alkyl substituted by C_1–C_4-alkoxy or cyano;

M = H, alkali metal cation, ammonium, C_1–C_4-monoalkylammonium, C_1–C_4-dialkylammonium, or pyridinium;

Z = —O— or —S—;

Y = —O—, —S—, or

;

R_3 = hydrogen or C_1–C_4-alkyl;

n = 0, 1, or 2;

A and B are as shown in the above formula or additionally are substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, nitro, C_1–C_4-alkylmercapto, carboxy, C_1–C_4-alkylsulfonyl, phenylsulfonyl, C_1–C_4-alkylcarbonylamino, C_1–C_4-alkylsulfonylamino, carbonamido, sulfonamido, or either of carbonamido or sulfonamido monosubstituted or disubstituted by C_1–C_4-alkyl; and

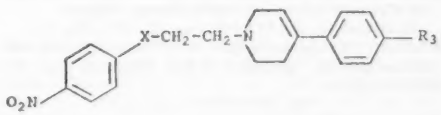
D and E are as shown in the above formulas or additionally are substituted by a fused benzene ring, C_1–C_4-alkyl, cyanoethyl, trifluoromethyl, C_1–C_4-alkoxy, halogen, cyano, cyclohexyl, phenyl-C_1–C_3-alkyl, phenyl, C_1–C_4-alkylsulfonyl, phenylsulfonyl, sulfonamido, or sulfonamido monosubstituted or disubstituted by C_1–C_4-alkyl.

3,927,006
TETRAHYDROPYRIDINE DERIVATIVES

Albrecht Edenhofer, Riehen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 362,636, May 21, 1973, Pat. No. 3,879,405, which is a division of Ser. No. 148,119, May 28, 1971, Pat. No. 3,758,483. This application Jan. 13, 1975, Ser. No. 540,755
Claims priority, application Switzerland, June 19, 1970, 9318/70
Int. Cl.² C07D *213/69*
U.S. Cl. 260—294.8 G **1 Claim**

1. A compound of the formula



wherein R_3 signifies fluorine, chlorine or lower alkoxy and X signifies an oxygen atom or a sulfur atom.

3,927,007
CATALYSTS FOR THE PRODUCTION OF AROMATIC AND HETEROAROMATIC NITRILES

Theodor Lüssling; Hans Schaefer, both of Grossauheim, and Wolfgang Weigert, Offenbach, all of Germany, assignors to Deutsche God- und Silber-Scheideanstalt vormals Roessler, Germany

Division of Ser. No. 167,878, July 30, 1971, abandoned. This application Aug. 23, 1973, Ser. No. 390,775
Claims priority, application Germany, Aug. 8, 1970, 2039497
Int. Cl.² C07D *213/00*; C07C *120/14*
U.S. Cl. 260—294.9 **13 Claims**

1. In a process of preparing o-phthalodinitrile or nicotinonitrile from o-xylene or beta-picoline and ammonia and a large excess of oxygen in the gas phase the improvement comprising carrying out the reaction employing as the catalyst a catalyst consisting essentially of the product prepared by heating at 650° to 1000°C in the presence of oxygen a mixture made of (A) the elements (1) Sb, (2) V and (3) an element of the group consisting of Fe, Cu, Ti, Co, Mn or Ni or (B) compounds of such elements (1), (2) and (3) which are oxides or (C) compounds of such elements (1), (2) and (3) which are convertible to oxides by oxygen, wherein the atomic ratio of antimony to vanadium is from 1.1:1 to 50:1 and the atomic ratio of antimony to the total of Fe, Cu, Co, Mn and Ni is from 2:1 to 20:1 and the atomic amount of said other element does not exceed that of vanadium and the atomic ratio of antimony to titanium is from 1:3 to 8:1, said nitrile being formed by replacing an alkyl group of said o-xylene or beta-picoline by a nitrile group.

3,927,008
5-(3-PYRIDYL)-2-FUROIC ACID

Denis M. Bailey, East Greenbush, N.Y.

Division of Ser. No. 392,936, Aug. 30, 1973, Pat. No. 3,890,335. This application Oct. 29, 1974, Ser. No. 518,856
Int. Cl.[2] C07D *213/55*
U.S. Cl. 260—295.5 R 1 Claim

1. 5-(3-Pyridyl)-2-furoic acid.

3,927,009
PROCESS FOR MANUFACTURE OF BIPYRIDYLS

Sheila Antoinette Potter, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 171,349, Aug. 12, 1971, Pat. No. 3,787,427. This application July 16, 1973, Ser. No. 379,308
Claims priority, application United Kingdom, Aug. 17, 1970, 39481/70
Int. Cl.[2] C07D *213/72*
U.S. Cl. 260—296 D 12 Claims

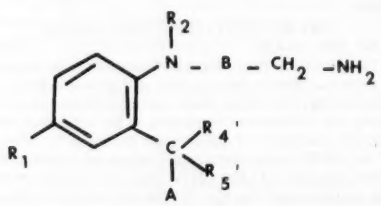
1. A process for the manufacture of a 2,2′-bipyridyl, a 2,4′-bipyridyl or a 4,4′-bipyridyl which consists essentially of heating pyridine in the liquid phase under substantially anhydrous conditions with a member selected from the group consisting of a 1-(4-pyridyl)-pyridinium halide and the hydrohalide addition salts thereof at a temperature of at least 150°C and up to 400°C.

3,927,010
DIARYLMETHANE DERIVATIVES AND PROCESSES FOR THEIR PREPARATION

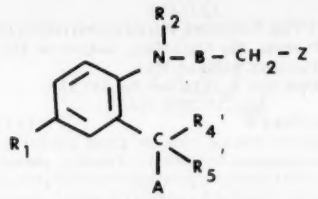
Joseph Hellerbach, and André Szente, both of Basel, Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 78,938, Oct. 7, 1970, abandoned. This application Aug. 8, 1973, Ser. No. 386,666
Claims priority, application Switzerland, Oct. 17, 1969, 15533/69; Jan. 27, 1970, 1103/70
Int. Cl.[2] C07D *213/74*
U.S. Cl. 260—296 R 2 Claims

1. A process for the preparation of a compound of the formula



wherein R_1 represents halogen, nitro or trifluoromethyl; R_2 represents hydrogen, lower alkyl, hydroxy-lower alkyl, or di-lower alkylamino-lower alkyl; R_4' and R_5' each independently signify lower alkoxy; A represents phenyl, halophenyl or pyridyl; and B represents a methylene group,,
which comprises reacting a compound of the formula



wherein R_1, R_2, R_4, R_5, A and B are as described above and Z represents a member selected from the group consisting of chlorine, bromine, iodine, a lower alkyl sulphonyloxy group and a phenyl or tolylsulphonyloxy group with ammonia in the presence of an inert organic solvent.

3,927,011
2-AMINOALKYL-1-(PYRIDYLCARBONYLPHENYL-)IMIDAZOLE COMPOUNDS

Michio Nakanishi, Oita; Tetsuo Yokobe, Fukuoka; Tomio Arai, Fukuoka, and Masao Abe, Fukuoka, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

Filed Jan. 9, 1974, Ser. No. 432,115
Claims priority, application Japan, May 10, 1973, 48-52232; May 14, 1973, 48-53826; June 16, 1973, 48-68116; July 7, 1973, 48-76945
Int. Cl.[2] C07D *213/36*
U.S. Cl. 260—296 R 1 Claim

1. The compound:
1-[4-Nitro-2-(2-pyridylcarbonyl)phenyl]-2-(dimethylaminomethyl)imidazole and the pharmaceutically acceptable acid addition salts thereof.

3,927,012
YELLOW SULFUR DYESTUFF AND PREPARATION THEREOF

Artur Meyer, Schoneck; Ulrich Gotsmann, Bergen-Enkheim, and Ernst Meyer, Frankfurt am Main-Fechenheim, all of Germany, assignors to Cassella Farbwerke Mainkur AG, Germany

Filed June 21, 1974, Ser. No. 481,705
Claims priority, application Germany, June 27, 1973, 2332558
Int. Cl.[2] C07D *277/66*
U.S. Cl. 260—304 9 Claims

1. A process for preparing ayellow sulfur dyestuff which comprises heating a mixture of
A. a member selected from the group consisting of
i. 2-(p-aminophenyl)-6-methylbenzothiazole,
ii. the by-product distillate obtained at about 135°C. and at a pressure of 5–6 mm Hg from the product of heating p-toluidine and sulfur to produce (i), said by-product distillate comprising 1-amino-2-mercapto-4-methylbenzene, bis-(2-amino-4-methylphenyl)sulfide and bis-(2-amino-4-methylphenyl)disulfide,
iii. a mixture of (i) and (ii);
B. sulfur and
C. phenylene diamine at a temperature of from about 180° to about 400°C., the molar ratio of (A) to (C) being about 2:1 and the molar ratio of (B) to (A) being about 5–7:1.

3,927,013
CERTAIN 4,7-DIAZA-6-OXO-2-THIABICYCLO[3,2,0]HEPT-3-ENES

Derek Harold Richard Barton, London; William George Elphinstone Underwood, Stoke Poges; Brian Edgar Looker, Greenford, and Graham Hewitt, Northolt, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

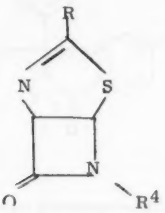
Filed July 30, 1971, Ser. No. 167,849

Claims priority, application United Kingdom, Nov. 3, 1970, 52290/70

Int. Cl.² C07D *513/04*

U.S. Cl. 260—306.7 C **11 Claims**

1. A compound of the formula:



where R is phenyl, fluorophenyl, nitrophenyl, aminophenyl, phenoxymethyl, acetoxyphenyl, methoxyphenyl, methylphenyl, hydroxyphenyl, N,N-bis (2-chloroethyl)amino-phenyl, thien-2-yl, thien-3-yl, isoxazol-4-yl, pyridyl, tetrazolyl, 3-phenyl-5-methyl isoxazol-4-yl, or 3-chlorophenyl or 3-bromophenyl-5-methyl isoxazol-4-yl; R^4 is a benzyl, p-nitrobenzyl, diphenylmethyl, or alkyl of up to 4 carbon atoms ester of carboxymethyl, dicarboxymethyl, (bromo)(carboxy)ethyl or (benzoyl)(carboxy)methyl.

3,927,014
SUBSTITUTED MERCAPTO BENZIMIDAZOLES

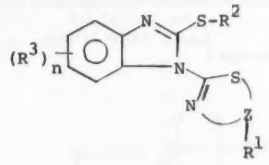
George Rovnyak, Hopewell; Venkatachala L. Narayanan, Hightstown; Rudiger D. Haugwitz, Titusville, and Christopher M. Cimarusti, Hamilton, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 29, 1974, Ser. No. 492,644

Int. Cl.² C07D *235/28*

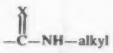
U.S. Cl. 260—306.7 T **8 Claims**

1. A compound of the formula:

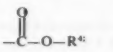


wherein Z is ethylene or propylene; R^1 is hydrogen, methyl, ethyl, phenyl, nitrophenyl, benzyl, phenethyl, tolyl, or xylyl; R^2 is alkyl of 1 to 5 carbons, benzyl, nitrobenzyl, phenethyl, nitrophenethyl, alkoxycarbonylalkylene wherein alkoxy is of 1 to 5 carbons and alkylene is of 1 to 3 carbons, dialkylaminoalkylene wherein each alkyl is of 1 to 3 carbons and alkylene is of 2 or 3 carbons, alkanoyl of from 2 to 18 carbons, benzoyl, substituted benzoyl wherein said substituent is halogen, alkyl of 1 to 3 carbons, or phenyl, phenylmethylcarbonyl, phenethylcarbonyl,

wherein R^1 and Z are as defined above,



wherein alkyl is of 1 to 5 carbons, or



X is oxygen or sulfur; R^4 is alkyl of 1 to 3 carbons, phenyl, benzyl, or phenethyl; R^3 is hydrogen, halogen, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 3 carbons alkoxy of 1 to 3 carbons, dialkylamino wherein each alkyl is of 1 to 3 carbons, alkanoyl of 2 to 6 carbons, or benzoyl; and *n* is 1 or 2; and when R^2 is dialkylaminoalkylene or R^3 is amino or dialkylamino the pharmaceutically acceptable acid-addition salts.

3,927,015
2-(3-HYDROXYAMINOMETHYL-S-TRIAZOL-4-YL)BENZOPHENONES

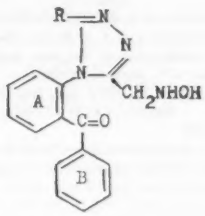
Yutaka Kuwada; Kanji Meguro, both of Hyogo, and Hiroyuki Tawada, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 255,993, May 23, 1972, abandoned. This application June 24, 1974, Ser. No. 482,798

Int. Cl.² C07D *249/08, 487/04*

U.S. Cl. 260—308 R **7 Claims**

1. A compound of the formula



wherein R represents hydrogen or lower alkyl, and the rings A and B, independently of each other, are each unsubstituted or substituted by one member selected from the group consisting of halogen, nitro, trifluoromethyl, lower alkyl and lower alkoxy.

3,927,016
6-SUBSTITUTED 4H-IMIDAZO (1,2-A) (1,4)-BENZODIAZEPINE-1-CARBOXALDEHYDES AND PROCESSES FOR THEIR PRODUCTION

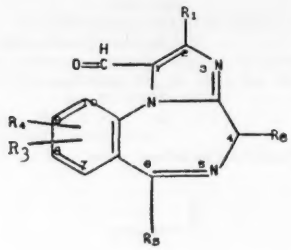
Jackson B. Hester, Jr., Galesburg, Mich., and Arthur R. Hanze, deceased, late of Kalamazoo, Mich. (by Janice W. Hanze, administratrix), assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 169,091, Aug. 4, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,512

Int. Cl.² C07D *487/04*

U.S. Cl. 260—309 **6 Claims**

1. A compound of the formula:



wherein R_1 and R_6 are each selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, inclusive; R_3 and R_4 are each selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms, inclusive, halogen, nitro, cyano, amino, trifluoromethyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkanoylamino and dialkylamino in which the carbon chain moieties are of 1 to 3 carbon atoms, inclusive; and R_5 is selected from the group consisting of pyridyl, 2-pyrimidyl, furyl, pyrryl, thienyl, alkyl of 1 to 3 carbon atoms, inclusive, alkenyl of 2 to 3 carbon atoms, inclusive, cycloalkyl of 5 to 7 carbon atoms, inclusive, cycloalkenyl of 5 to 7 carbon atoms, inclusive, and a phenyl radical of the formula

in which R_8 and R_9 each have the same meanings as given above for R_3 and R_4, and the pharmacologically acceptable acid addition salts thereof.

3,927,017

1-(β-ARYL-β-R-ETHYL)IMIDAZOLES

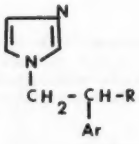
Jan Heeres, Vosselaar; Leo J. J. Backx, Geel, and Joseph H. Mostmans, Antwerp, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Filed June 27, 1974, Ser. No. 483,587

Int. Cl.² C07D *233/60*

U.S. Cl. 260—309 **7 Claims**

1. A chemical compound selected from the group consisting of an imidazole derivative having the formula:



and the therapeutically active non-toxic acid addition salts thereof, wherein:

Ar is a member selected from the group consisting of phenyl, mono-, di- and tri-halophenyl, loweralkylphenyl, loweralkyloxyphenyl, nitrophenyl, cyanophenyl and trifluoromethylphenyl; and

R is a member selected from the group consisting of cycloalkyl, lower alkenyl, aryl-loweralkyl, aryl-loweralkenyl, said aryl being a member selected from the group consisting of phenyl, mono-, di- and tri-halophenyl, loweralkylphenyl, loweralkyloxyphenyl, nitrophenyl, cyanophenyl and trifluoromethylphenyl.

3,927,018

3-(2-METHYL-1-IMIDAZOLYL)-3-PHENYL-1-(3H)ISOBENZOFURANONES

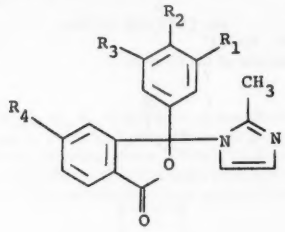
William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Dec. 23, 1974, Ser. No. 535,438

Int. Cl.² C07D *405/04*

U.S. Cl. 260—309 **5 Claims**

1. A compound of the formula



where

R_1, R_2 and R_3 each independently represent hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl having 1 to 4 carbon atoms, lower alkoxy having 1 to 4 carbon atoms, trifluoromethyl, or

R_1 and R_2 or R_2 and R_3 together on adjacent carbon atoms may represent methylenedioxy,

R_4 represents hydrogen, halo having an atomic weight of about 19 to 36, or lower alkyl having 1 to 4 carbon atoms, provided that R_2 is trifluoromethyl or t-butyl only when R_1 and R_3 are other than trifluoromethyl or t-butyl, or a pharmaceutically acceptable acid addition salt thereof.

3,927,019

1-OXYLIMIDAZOLINYL COMPOUNDS USED AS STABLE FREE RADICAL PH INDICATORS

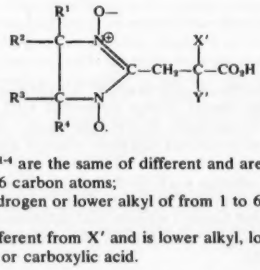
Jan Becher, Grindlose, and Edwin F. Ullman, Atherton, both of Calif., assignors to Synvar Associates, Palo Alto, Calif.

Division of Ser. No. 117,669, Feb. 22, 1971, Pat. No. 3,706,537, which is a continuation-in-part of Ser. No. 794,008, Jan. 27, 1969, abandoned. This application June 29, 1972, Ser. No. 267,345

Int. Cl.² C07D *233/22*

U.S. Cl. 260—309.6 **2 Claims**

1.



wherein R^{1-4} are the same of different and are lower alkyl of from 1 to 6 carbon atoms;

X′ is hydrogen or lower alkyl of from 1 to 6 carbon atoms; and

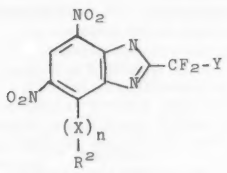
Y′ is different from X′ and is lower alkyl, lower alkoxycarbonyl or carboxylic acid.

3,927,020
4-SUBSTITUTED-5,7-DINITRO-2-(α,α-DIFLUOROALKYL)BENZIMIDAZOLE COMPOUNDS

John L. Miesel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 221,809, Jan. 28, 1972, Pat. No. 3,790,595, which is a continuation-in-part of Ser. No. 833,685, June 16, 1969, abandoned. This application Sept. 10, 1973, Ser. No. 415,099
Int. Cl.² C07D *235/10*
U.S. Cl. 260—309.2 4 Claims

1. A compound of the formula



wherein
Y represents
a. hydrogen,
b. chlorine,
c. fluorine,
d. trifluoromethyl, or
e. pentafluoroethyl,
and wherein X represents oxygen or sulfur; *n* represents 0 or 1; and R^2 represents
1. alkyl of C_1–C_8, both inclusive, carbon atoms;
2. alkenyl of C_3–C_8, both inclusive, carbon atoms;
3. cycloalkyl of C_5–C_7, both inclusive;
4. cycloalkylmethyl, wherein cycloalkyl is as defined in the preceding candidate moiety;
5. loweralkylcycloalkyl, wherein loweralkyl is of C_1–C_4, both inclusive, and cycloalkyl is as defined in the preceding candidate moiety;
6. 2-norbornyl; or
7. decahydronapthyl.

3,927,021
ALLANTOIN GLYCINE COMPLEX

Sebastian B. Mecca, Abington, Pa., assignor to Schuylkill Chemical Company, Philadelphia, Pa.

Filed Feb. 24, 1975, Ser. No. 552,315
Int. Cl.² C07D *49/32*
U.S. Cl. 260—309.5 1 Claim

1. Allantoin glycinate.

3,927,022
2-AMINO-1-(2-IMIDAZOLIN-2-YL)-2-IMIDAZOLINES

Raymond R. Wittekind, Morristown, and John Shavel, Jr., Mendham, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 253,074, May 15, 1972, Pat. No. 3,798,232, and a continuation-in-part of Ser. No. 6,639, Jan. 28, 1970, Pat. No. 3,666,767. This application Nov. 7, 1973, Ser. No. 414,561
Int. Cl.² C07D *49/34*
U.S. Cl. 260—309.6 1 Claim

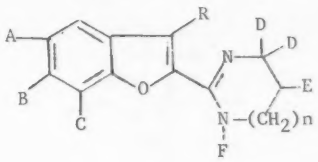
1. 1-(2-Imidazolin-2-yl)-2- [2-(4-imidazolyl)ethyl]amino - 2-imidazoline Hydrochloride.

3,927,023
IMIDAZOLYL BENZOFURANS

Richard E. Brown, Hanover, and John Shavel, Jr., Mendham, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 24, 1974, Ser. No. 473,253
Int. Cl.² C07D *233/04*
U.S. Cl. 260—309.6 17 Claims

1. A compound of the formula



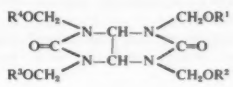
in which A, B, and C are hydrogen or lower alkyl of 1 to 6 carbon atoms, halogen, lower alkoxy of 1 to 6 carbon atoms, or an aromatic ring; R is hydrogen, lower alkyl of 1 to 6 carbon atoms, hydroxy, amino or an aromatic ring; D is hydrogen or lower alkyl of 1 to 6 carbon atoms, E is hydrogen, lower alkyl of 1 to 6 carbon atoms, or hydroxy; F is hydrogen, lower alkyl of 1 to 6 carbon atoms, or β-hydroxyethyl and *n* is 0 and the pharmaceutically acceptable acid addition salts thereof.

3,927,024
GLYCOLURILE DERIVATIVES

Dimitri Savostianoff, Asnieres, and Denise Dubos, Paris, both of France, assignors to Nobel Hoechst Chimie, Puteaux, France

Filed Jan. 30, 1973, Ser. No. 328,061
Claims priority, application France, Feb. 1, 1972, 72.03355; Dec. 18, 1972, 72.45091
Int. Cl. C07d *49/30*
U.S. Cl. 260—309.7 4 Claims

1. A compound of the formula



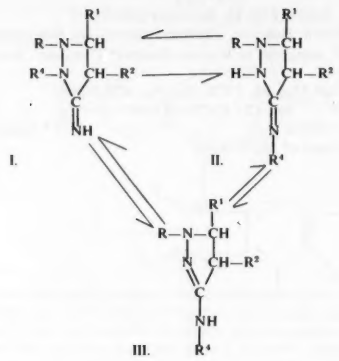
or isomeric mixtures thereof, wherein one of R^1, R^2, R^3, or R^4 is alkyl of 10–18 carbons, alkanoyl of 10–18 carbons or $(CH_2)_r$-R_4 in which r is one and R_4 is a perfluorinated alkyl of 7 carbons; one of R^1, R^2, R^3, or R^4 is $(AO)_mR_5$ wherein A is ethylene or propylene, m is 5–30 and R_5 is alkyl of 1–4 carbons; and the remaining two of R^1, R^2, R^3, and R^4 are the same and are alkyl of 1–3 carbons.

3,927,025
3-AMINO-Δ²-PYRAZOLINE DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

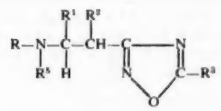
Dezső Korbonits, 27d, Verhalom u., Budapest II; Kálmán Hársanyi, 19-21, Egri J.u., Budapest XI; Erzsébet Molnár née Bakó, 58, Cservenka utca, Budapest XV; Kálmán Takács, 12, Vass u., Budapest VIII; Gergely Héja, 27, Sollner utca, Budapest XIII; János Bodnár, 17b, Menesi ut, Budapest XI; István Bodrogi, 36, Zoltan utca, Budapest XIX, and Judit Erődi, 20/d, Hungaria korut, Budapest VIII, all of Hungary

Continuation-in-part of Ser. No. 61,841, Aug. 6, 1970, abandoned. This application Jan. 7, 1972, Ser. No. 216,252
Claims priority, application Hungary, Aug. 7, 1969, CI 913
Int. Cl.² C07D *231/06*
U.S. Cl. 260—310 D 11 Claims

1. A process for preparing a compound having the tautomeric formulae:



wherein R is a C_1–C_7 alkyl or a C_1–C_7 alkyl substituted with at least one member of the group consisting of halogen, amino, nitro, hydroxy, C_1–C_7 alkylamino, C_1–C_7 dialkyl amino and phenyl; a C_3–C_6 cycloalkyl; an aryl group selected from the group consisting of phenyl, naphthyl and pyridyl or said aryl group substituted with a member selected from the group consisting of halogen, amino, nitro, C_1–C_7 alkyl, alkoxy, alkylamino and dialkylamino; an aralkyl group wherein the alkyl moiety has 1 to 5 carbon atoms and the aryl moiety is as defined above; R^1 and R^2 may each be hydrogen, a C_1–C_7 alkyl or a C_1–C_7 alkyl substituted with at least one member of the group consisting of halogen, amino, nitro, hydroxy, C_1–C_7 alkylamino, C_1–C_7 dialkyl amino and phenyl; an aryl group selected from the group consisting of phenyl, naphthyl and pyridyl or said aryl group substituted with a member selected from the group consisting of halogen, amino, nitro, C_1–C_7 alkyl, alkoxy, alkylamino and dialkylamino; and R^4 is hydrogen, an acyl radical of an aliphatic organic carboxylic acid having 1–20 carbon atoms or an aromatic carboxylic acid having 6–10 carbon atoms; and salts thereof, which process comprises reacting a compound having the formula IV:



IV.

or a salt thereof wherein R, R^1 and R^2 have the same meaning as stated above; R^3 is a C_1–C_7 alkyl group or a C_1–C_7 alkyl substituted with at least one member of the group consisting of halogen, amino, nitro, hydroxy, C_1–C_7 alkylamino, C_1–C_7 dialkylamino and phenyl; an aryl group group selected from the group consisting of phenyl, naphthyl and pyridyl or said aryl group substituted with a member selected from the group consisting of halogen, amino, nitro, C_1–C_7 alkyl, alkoxy, alkylamino and dialkylamino; an aralkyl group wherein the alkyl moiety has 1 to 5 carbon atoms and the aryl moiety is as defined above; and R^5 is hydrogen or an acyl group selected from the group consisting of C_1–C_{20} alkanoyl, C_6–C_{20} aroyl, C_1–C_7 alkylsulfonyl, and arylsulfonyl wherein the aryl is phenyl, naphthyl or pyridyl, with a base.

3,927,026
PROCESS OF MAKING X-FORM METAL PHTHALOCYANINE

Paul J. Brach, Rochester, N.Y., and Hugh A. Six, Los Altos, Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 830,116, June 3, 1969, abandoned. This application Apr. 23, 1973, Ser. No. 353,838The portion of the term of this patent subsequent to Apr. 18, 1989, has been disclaimed.

Int. Cl.[2] C09B *47/04*

U.S. Cl. 260—314.5 **11 Claims**

1. A method of preparing X-form metal phthalocyanine comprising the steps of:

a. mixing phthalonitrile in an alkylalkanolamine solvent;
b. adding ammonia to the mixture;
c. terminating the ammonia addition
d. adding a catalytic amount of an X-form phthalocyanine;
e. adding a metal salt; and
f. refluxing.

3,927,027
BIS(FURFURYL) IMIDE

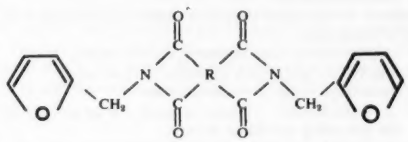
Robert J. Jones, Hermosa Beach, and Howard E. Green, Los Angeles, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Oct. 31, 1973, Ser. No. 411,516

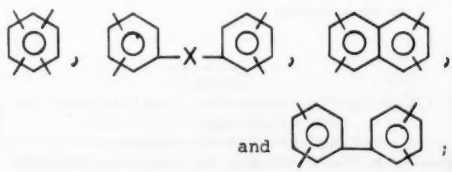
Int. Cl.[2] C07D *487/04*

U.S. Cl. 260—326 S **1 Claim**

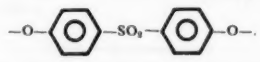
1. A bis(furfuryl) imide having the structure:



wherein R is a tetrafunctional radical selected from the group consisting of



wherein X is —O—, —S—, $—SO_2—$, —CO—, $—CH_2—$, $—C_2H_4—$, $—C_3H_6—$, and



3,927,028
SULTONE EXTRACTION PROCESS

William A. Sweeney, Larkspur, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 874,421, Nov. 5, 1969, abandoned. This application Sept. 5, 1974, Ser. No. 502,999

Int. Cl.[2] C07D *327/02*

U.S. Cl. 260—327 S **11 Claims**

1. A process for recovering sultones from the reaction mixture produced by reacting sulfur trioxide with a monoolefinic hydrocarbon containing a total of 8 to 30 carbon atoms, said process comprising the steps of:

1. adding water to said reaction mixture in a weight ratio relative to the weight of the reaction mixture of from 1:3 to 3:1;
2. adding to said reaction mixture a water-soluble polar, organic cosolvent having from 1 to 4 carbon atoms in a weight ratio relative to water of from 4:1 to 1:1;
3. extracting the mixture resulting from Steps (1) and (2) with a hydrocarbon solvent; and
4. removing the hydrocarbon solvent from the product of Step (3) to produce a hydrocarbyl sultone;

wherein Steps (1) and (2) may be performed in any order or simultaneously and wherein the temperature of the reaction mixture during Steps (1), (2) and (3) is from about 10° to 80°C.

3,927,029
XANTHEN DERIVATIVES

Stuart Sanders Adams; Bernard John Armitage; Norman William Bristow, and Bernard Vincent Heathcote, all of Nottingham, England, assignors to The Boots Company Limited, England

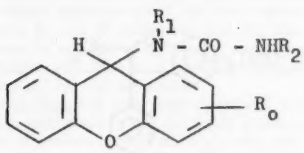
Continuation of Ser. No. 191,112, Oct. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 662,587, Aug. 23, 1967, Pat. No. 3,644,420. This application Oct. 23, 1973, Ser. No. 408,378

Claims priority, application United Kingdom, Sept. 2, 1966, 39384/66; Apr. 5, 1967, 15692/67

Int. Cl.² C07D *311/88*

U.S. Cl. 260—335 **3 Claims**

1. A compound represented by the formula I



. . . I

in which

R_0 is selected from the group consisting of hydrogen, halogen, alkyl and alkoxy;

R_1 is alkyl;

and R_2 is selected from the group consisting of hydrogen, alkyl, hydroxyalkyl, alkanoyloxyalkyl, alkoxyalkyl and alkanoyl;

and wherein the terms "alkyl", "alkoxy", "alkanoyloxy" and "alkanoyl" indicate such groups containing up to 7 carbon atoms.

3,927,030
6,8-DIOXA-BICYCLO [3.2.1] OCTANE AND 2,9-DIOXA-BICYCLO [3.3.1] NONANE DERIVATIVES

Edouard P. Demole, Coppet, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

Filed Mar. 15, 1974, Ser. No. 451,423

Claims priority, application Switzerland, Apr. 10, 1973, 5122/73; Apr. 12, 1973, 5274/73

Int. Cl.² C07D *317/08, 319/08*

U.S. Cl. 260—340.3 **1 Claim**

1. A compound selected from the group consisting of:

a. 2-isopropyl-5-methyl-6,8-dioxa-bicyclo[3.2.1.]octan-7-yl-methyl-ketone,

b. 2-(2-isopropyl-5-methyl-6,8-dioxa-bicyclo[3.2.1]octan-7-yl)-propan-2-ol,

c. 6-isopropyl-1,3,3-trimethyl-2,9-dioxa-bicyclo[3.3.1]nonan-4-ol, and

d. 1-(2-isopropyl-5-methyl-6,8-dioxa-bicyclo[3.2.1]octan-7-yl)-ethan-1-ol.

3,927,031
STEREOSPECIFIC TOTAL STEROIDAL SYNTHESIS VIA SUBSTITUTED C/D-TRANS INDANONES

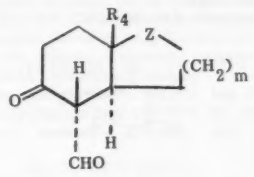
Zoltan George Hajos, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 765,023, Oct. 4, 1968, Pat. No. 3,897,460. This application June 24, 1974, Ser. No. 482,714

Int. Cl.² C07C *49/27*; C07D *317/26*

U.S. Cl. 260—340.9 **2 Claims**

1. A compound of the formula:



wherein R_4 is hydrogen or lower alkyl; Z is carbonyl, lower alkylenedioxy methylene or $CH(OR_2)$; R_2 is hydrogen, lower alkyl, lower alkoxy-lower alkyl, phenyl-lower alkyl, tetrahydropyranyl, lower alkanoyl, benzoyl, nitrobenzoyl, carboxy-lower alkanoyl, carboxy-benzoyl, trifluoroacetyl, or camphorsulfonyl and m is an integer having the value of 1 or 2,

its optical enantiomer and the racemate thereof.

3,927,032
INTERMEDIATES FOR BENZINDENES

Andor Furst, Basel; Paul Buchschacher, Arlesheim; Dieter Kagi, Allschwil; Werner Meier, Bottmingen; Marcel Müller, Frenkendorf, and Erich Widmer, Munchenstein, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

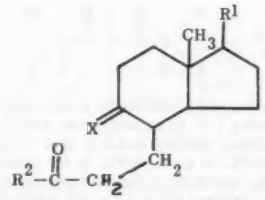
Division of Ser. No. 256,555, May 24, 1972, Pat. No. 3,810,915. This application Mar. 27, 1974, Ser. No. 455,084

Claims priority, application Switzerland, Nov. 19, 1968, 17224/68

Int. Cl.² C07D *317/30*

U.S. Cl. 260—340.9 **5 Claims**

1. A compound of the general formula



wherein X is a C_{1-8} alkylidene group; R^2 is hydroxy, lower alkoxy or halogen and R^1 151,1-ethylenedioxyethyl.

3,927,033
LASING DYE AND METHOD OF PREPARATION

Peter R. Hammond, China Lake, Calif., assignor to Peter R. Hammond, China Lake, Calif. and The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 25, 1974, Ser. No. 526,760

Int. Cl.² C07D *311/16*

U.S. Cl. 260—343.2 R **3 Claims**

1. 4-Trifluoromethyl-7-hydroxycoumarin.

3,927,034
3,4-DIHYDRO-2H-PYRANE-2,4-DIONES

Mikio Sawaki; Isao Iwataki, both of Odawara; Yoshihiko Hirono, Hiratsuka; Hisao Ishikawa, Kanagawa; Shozo Yamada, Hiratsuka; Yasushi Yasuda, Hiratsuka, and Mitsuo Asada, Hiratsuka, all of Japan, assignors to Nippon Soda Company, Limited, Tokyo, Japan

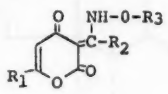
Filed Oct. 15, 1973, Ser. No. 406,621

Claims priority, application Japan, Oct. 20, 1972, 47-104962; Dec. 25, 1972, 47-2526; Dec. 25, 1972, 47-2527

Int. Cl.² C07D *309/30*

U.S. Cl. 260—343.5 **9 Claims**

1. A compound of the formula



wherein

R_1 is alkyl of 2 to 3 carbon atoms,

R_2 is alkyl of 2 to 3 carbon atoms and

R_3 is selected from the group consisting of ethyl and allyl.

3,927,035
PRODUCTION OF 2,2-DISUBSTITUTED PROPIOLACTONES

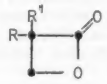
Jerry D. Holmes, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 3, 1972, Ser. No. 303,568

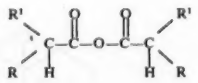
Int. Cl.² C07D *305/12*

U.S. Cl. 260—343.9 **22 Claims**

1. A process for producing a 2,2-disubstituted propiolactone having the formula



which comprises the steps of reacting an isoanhydride having the formula



wherein R and R^1 individually is straight or branched chain alkyl having 1 to 10 carbon atoms, with formaldehyde or a formaldehyde yielding material at a temperature of from about 190°C. to about 400°C. in the presence of a catalyst consisting essentially of the calcined reaction product of the complex obtained when a tin salt selected from the group consisting of stannous chloride, stannic chloride, stannous bromide, stannic bromide, stannous isobutyrate, stannous acetate, and stannous benzoate is reacted with silica gel at a temperature of from about 60°C. to about 250°C.

3,927,036
BASIC CARBONATES AND CARBAMATES OF BENZOPYRANS

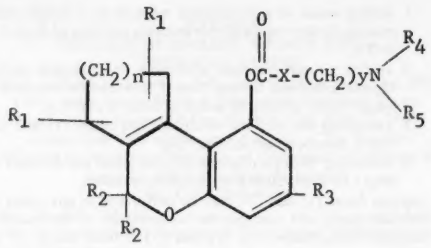
Cheuk Man Lee, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed May 25, 1972, Ser. No. 256,954

Int. Cl.² C07D *311/80, 311/94*

U.S. Cl. 260—345.3 **11 Claims**

1. A compound of the formula



wherein n is 1 or 2; each R_1 is hydrogen or loweralkyl; R_2 is loweralkyl; R_3 is alkyl of from 1 to 20 carbon atoms or cycloalkyl of from 3 to 8 carbon atoms; X is O or NH; y is an integer from 2–6; and R_4 and R_5 each are hydrogen or loweralkyl, or a pharmaceutically acceptable acid addition salt thereof.

3,927,037
ALKOXY-SUBSTITUTED-2-NITRO-3-PHENYLBENZOFURANS

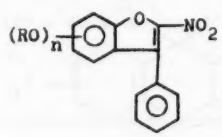
Robert A. Scherrer, White Bear Lake, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed Feb. 26, 1974, Ser. No. 446,006

Int. Cl.² C07D *307/82*

U.S. Cl. 260—346.2 R **7 Claims**

1. A compound of the formula



wherein each R is alkyl of one to six carbon atoms and n is 1–3.

3,927,038
METHOD OF PRODUCING ISOMERS OF METHYLTETRAHYDROPHTHALIC ANHYDRIDE

Alexandr Grigorievich Liakumovich, prospekt Lenina, 23, kv. 4; Jury Ivanovidh Michurov, ulitsa Khudaiberdina, 125, kv. 36; Nina Vasilievna Zakharova, prospekt Lenina, 23, kv. 4, all of Sterlitamak; Mikhail Afanasievich Golubenko, Bolshaya Filevskaya ultisa, 45, korpus 2, kv. 27, Moscow; Genrikh Alexandrovich Tolstikov, ulitsa Dostoevskogo, 102/3, kv. 61, Ufa; Rakhil Samoilovna Kholodovskaya, Krasnoarmeiskaya ulitsa, 5, kv. 53, Moscow; Zoya Stepanovna Shalimova, ulitsa Volochaevskaya, 16-a, kv. 19, Sterlitamak; Taisia Vasilievna Legostaeva, prospekt Lenina, 30, kv. 19, Obninsk Kaluzhskoi oblasti; Vasily Dmitrievich Popov, ulitsa Revoljutsionnaya, 15, kv. 13, and Vladimir Romanovich Dolidze, ulitsa Kurchatova, 30, kv. 6, both of Sterlitamak, all of U.S.S.R.

Filed Dec. 1, 1971, Ser. No. 203,820

Int. Cl.² C07D *307/89*

U.S. Cl. 260—346.3 **4 Claims**

1. A method of producing a liquid mixture of isomers of methyltetrahydrophthalic anhydride, consisting essentially of condensing trans-piperylene and maleic anhydride in an organic solvent at 40°–90°C., distilling off the solvent and unreacted reactants with subsequent thermal treatment of the solid residue consisting essentially of the condensation products at a temperature of 150°–250°C. to form a liquid product.

3,927,039

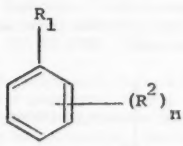
PURIFICATION OF PYROMELLITIC DIANHYDRIDE

Emmanuel R. E. G. Draguez Tripels De Hault, Waterloo; Marcel Van Tongelen, Diegem, and Henri R. Debus, Meise, all of Belgium, assignors to Labofina S. A., Brussels, Belgium

Filed Nov. 1, 1974, Ser. No. 519,806
Claims priority, application Belgium, Nov. 16, 1973, 137812
Int. Cl.² C07D *307/89*
U.S. Cl. 260—346.3 9 Claims

1. The process for the purification of impure pyromellitic dianhydride produced from the oxidation of tetraalkyl benzene wherein said purified pyromellitic anhydride exibits the characteristics of having a saybolt color value of at least about 13, an acid index value of at least about 18.20 and a percentage yield based on weight of at least about 93.5%, said process consisting essentially of the steps of:

a. contacting solid impure pyromellitic anhydride with a solvent consisting essentially of an alkyl benzene having the general formula:



wherein R_1 is a saturated aliphatic hydrocarbon radical containing from two to 20 carbon atoms, R^2 is a saturated aliphatic radical containing from one to 20 carbon atoms and *n* is an integer between 0 and 5, the total number of the carbon atoms in R_1 and R^2 being less than 25, said solvent being selective for said impurities to form a solid phase containing pyromellitic anhydride and a liquid phase containing said alkyl benzene solvent and impurities;

b. separating said solid phase containing purified pyromellitic anhydride from said liquid phase containing said alkyl benzene solvent and impurities; and

c. evaporating from said purified pyromellitic dianhydride any residual alkyl benzene remaining therein.

3,927,040

METHOD OF SIMULTANEOUS PRODUCTION OF PHTHALIC ANHYDRIDE AND ANTHRAQUINONE

Evgeny Iosifovich Andreikov, ulitsa Belinskogo, 152, korpus 2, kv. 83; Alexandr Stepanovich Kostromin, ulitsa Kraulya, 61, korpus 1, kv. 152, and Natalya Dmitrievna Rusyanova, ulitsa 8 Marta 7, kv. 3, all of Sverdlovsk, U.S.S.R.

Filed Aug. 9, 1973, Ser. No. 387,035
Claims priority, application U.S.S.R., Jan. 1, 1971, 1604520
Int. Cl.² C07D *307/89*; C07C *49/68*
U.S. Cl. 260—346.4 6 Claims

1. A method of simultaneously producing phthalic anhydride and anthraquinone comprising oxidizing a mixture of anthracene and naphthalene in the vapor phase with a molecular oxygen-containing gas in a stationary vanadium catalyst bed at a temperature of from 340° to 400°C.

3,927,041

PROCESS OF MAKING ALKENYL SUCCINIC ANHYDRIDE

John A. Cengel, Wheaton, and Imre Puskas, Glen Ellyn, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Oct. 1, 1973, Ser. No. 402,487
Int. Cl.² C07D *307/60*
U.S. Cl. 260—346.8 2 Claims

1. The method of preparing an alkenyl-succinic anhydride which comprises reacting at a temperature in the range of 150° to 300°C from 0.8 to 5.0 moles maleic anhydride per mole of butene polymer in the composition comprising butene polymer having a M_n in the range of 300–3,000 and 5–200 ppm of 1,3-dibromo-5, 5-dialkyl-substuted hydantoin based on said butene polymer, wherein such hydantoin the alkyl-substituents have a total of 2 to 21 carbon atoms.

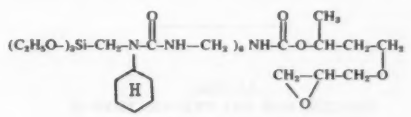
3,927,042

ALKOXYSILYL-SUBSTITUTED EPOXIDIZED UREA DERIVATIVES

Hans Dietrich Gölitz, deceased, late of Cologne, Germany (by Ingrid Irene Klärchen Gölitz, heiress); Kuno Wagner, Leverkusen, Germany; Bernd Quiring, Leverkusen, Germany, and Walter Noll, Opladen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 164,910, July 21, 1971, abandoned. This application May 29, 1973, Ser. No. 364,776
Claims priority, application Germany, July 29, 1970, 2037617
Int. Cl.² C07D *303/46*
U.S. Cl. 260—348 SC 3 Claims

1. An epoxidized organo-alkoxysilane of the formula:



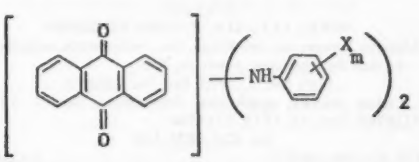
3,927,043

BIS-(POLYHALOGENOANILINO)-ANTHRAQUINONES

Arnold Wick, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 17, 1974, Ser. No. 461,567
Claims priority, application Switzerland, Apr. 19, 1973, 5756/73
Int. Cl.² C07C *97/25*; C09B *1/16*
U.S. Cl. 260—381 7 Claims

1. Bis-(polyhalogenoanilino)-anthraquinones of the formula



wherein X denotes a halogen atom and *m* denotes the number 3, 4 or 5.

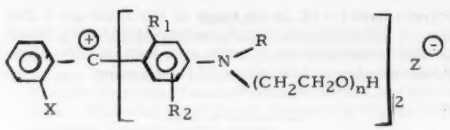
3,927,044

ALKALINE STABLE FUGITIVE TINTS

Larry R. Foster, and Hans H. Kuhn, both of Spartanburg, S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 47,573, June 18, 1970, abandoned. This application Mar. 19, 1973, Ser. No. 342,485
Int. Cl.² C09B *11/10*
U.S. Cl. 260—394 9 Claims

1. An alkaline stable fugitive tint compound having the formula



wherein

R is an alkyl or aryl radical containing up to 10 carbon atoms or

$$H(OCH_2CH_2)_n-$$

X is an electron withdrawing group selected from halogen, nitro and sulfonyl radicals

Z = anion moiety of an acid

R_1 and R_2 are H-, halogen, alkyl or alkoxy radicals having up to 10 carbon atoms, and

n is an integer between about 10 and 100.

3,927,045

PROCESS FOR THE PREPARATION OF TRIMETHYL-PARA-BENZAQUINONE

Daniel Michelet, Tassin-La-Demi-Lume, and Michel Razoutz, Ouillon, both of France, assignors to Rhone-Poulenc, Paris, France

Filed Jan. 14, 1974, Ser. No. 432,984

Claims priority, application France, Jan. 15, 1973, 73.01302

Int. Cl.² C07C *45/16, 37/00*

U.S. Cl. 260—396 R **9 Claims**

1. A process for the preparation of trimethyl-para-benzoquinone which comprises oxidising 2,3,6-trimethyl-phenol with hydrated manganese dioxide in an acid medium containing a saturated aliphatic carboxylic acid containing 1–3 carbon atoms at least about a fourfold excess of the carboxylic acid being present with respect to the phenol.

3,927,046

NOVEL 11,11-ALKYLIDENE STEROIDS

Albertus Joannes van den Broek, Oss, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

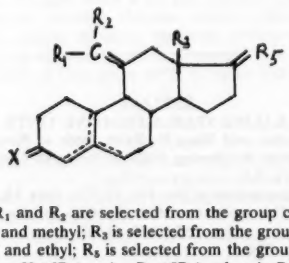
Filed Dec. 3, 1973, Ser. No. 420,823

Claims priority, application Netherlands, Dec. 9, 1972, 7216767; Nov. 15, 1973, 7315704

Int. Cl.² C07J *1/00*

U.S. Cl. 260—397.3 **3 Claims**

1. An 11,11-alkylidene steroid of the formula:



wherein R_1 and R_2 are selected from the group consisting of hydrogen and methyl; R_3 is selected from the group consisting of methyl and ethyl; R_5 is selected from the group consisting of oxygen, αH (βR_6) and α R_7 (βR_6), wherein R_6 is selected from the group consisting of hydroxy and acylated hydroxy, the acyl group of which is derived from a saturated or unsaturated organic carboxylic acid having 1–18 carbon atoms; R_7 is saturated or unsaturated alkyl having 1–4 carbon atoms; X is selected from the group consisting of H_2, oxygen and $H(R_8)$, where H_8 is selected from the group consisting of hydroxy and acetoxy; and a double bond is present starting from carbon atom 5.

3,927,047

NOVEL N-LONG CHAIN ACYL-ACIDIC AMINO ACID DIESTER

Tomomichi Ichikawa, Tokyo, and Sigetosi Fukami, Shinza, both of Japan, assignors to Ajinomoto Co., Inc. and Nihon Emulsion Co., Inc., both of Tokyo, Japan

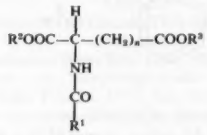
Filed Oct. 19, 1973, Ser. No. 407,813

Claims priority, application Japan, Oct. 23, 1972, 47-106018

Int. Cl.² C07C *101/22*

U.S. Cl. 260—404 **28 Claims**

1. An N-long chain acyl-acidic amino acid diester expressed by the general formula



wherein R^1CO— consists essentially of a residue of a straight-chain or branched-chain saturated or unsaturated aliphatic acid having 7 to 21 carbon atoms; R^2O and R^3O consist essentially of (1) a residue of a straight-chain or branched-chain saturated or unsaturated aliphatic alcohol having 8 to 30 carbon atoms, (2) a residue of a polyoxyalkylene higher alcohol ether composed of a straight-chain or branched-chain saturated or unsaturated monohydric alcohol having 8 to 30 carbon atoms and a polyoxyalkylene containing 1 to 20 oxyalkylene units with 2 to 4 carbon atoms, or (3) residue of a polyoxyalkylene higher fatty acid ester composed of a straight-chain or branched-chain saturated or unsaturated monovalent aliphatic acid and a polyoxyalkylene containing 1 to 20 polyoxyalkylene units with 2 to 4 carbon atoms; and *n* is 1 or 2.

3,927,048

PREPARATION OF ALKYLAMIDES

Roger George Duranleau, Ardonia, and Richard F. Love, Fishkill, both of N.Y., assignors to Texaco, Inc., New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,267

Int. Cl.² C07C *103/02*

U.S. Cl. 260—404 **10 Claims**

1. A method of preparing an alkylamide which comprises contacting a nitroketone with formic acid.

3,927,049

PREPARATION OF ALKYLAMIDES

Mahmoud S. Kablaoui, Wappingers Falls, and Roger G. Duranleau, Ardonia, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,266

Int. Cl.² C07C *103/02*

U.S. Cl. 260—404 **27 Claims**

1. A method of preparing an alkylamide which comprises contacting an ammonium, Group IA or Group IIA metal salt of an alpha-nitroketone with an acidic mineral acid salt in the presence of a carboxylic acid solvent.

3,927,050
PREPARATION OF ALKYLAMIDES

Roger G. Duranleau, Ardonia, and John M. Larkin, Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,268
Int. Cl.² C07C *103/02*
U.S. Cl. 260—404 **17 Claims**

1. A method of preparing an alkylamide which comprises contacting a nitroketone with nitric acid, sulfuric acid or phosphoric acid as catalyst in the presence of a carboxylic acid solvent.

3,927,051
PROCESS FOR THE PREPARATION OF AN UNSATURATED CARBOXYLIC ACID

Willem J. de Klein, Dieren, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Sept. 4, 1973, Ser. No. 394,267
Claims priority, application Netherlands, Sept. 8, 1972, 7212205
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 **9 Claims**

1. A process for the preparation of an ethylenically unsaturated carboxylic acid comprising reacting an ethylenically unsaturated hydrocarbon with a lower carboxylic acid or anhydride thereof in the presence of a manganese compound which is at least trivalent and in the presence of a bivalent copper compound and hydrolyzing the thus obtained reaction product.

3,927,052
CATALYST

Luis R. Vizurraga, Charlotte, N.C., assignor to Fiber Industries Inc., Charlotte, N.C.

Division of Ser. No. 86,302, Nov. 2, 1970, Pat. No. 3,758,535, which is a continuation-in-part of Ser. No. 879,618, Nov. 24, 1969, abandoned. This application May 11, 1973, Ser. No. 360,241
Int. Cl.² C07F *7/22*
U.S. Cl. 260—429.7 **4 Claims**

1. As a catalyst suitable for use in the preparation of polyester polymers, a viscous liquid or paste product of the process of reacting a first compound of the formula

with a second compound of the formula

in quantities of from about 1.1 to about 20 moles of said second compound per mole of said silicon compound, wherein:

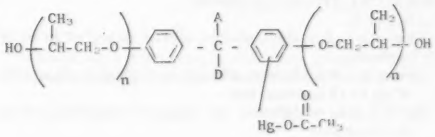
a. M is tin;
b. R_9 and R_4 are selected from the group consisting of chlorine and hydroxy;
c. the reacting R substituents are selected from the group consisting of alkyl of 1 to about 18 carbon atoms, aryl of 6 to about 18 carbon atoms, alkoxy of 1 to about 18 carbon atoms, and aryloxy of 6 to about 16 carbon atoms;
d. in said reaction said first compound and said second compound are reacted for from about 2 to about 6 hours; and
e. after said first compound and said second compound have been reacted with each other for from about 2 to about 6 hours, the reaction mixture is subjected to a vacuum of less than about 600 millimeters of mercury absolute for at least 30 minutes.

3,927,053
MONOMERCURY ORGANO CATALYST

James A. Galiagher, Grosse Ile, and Bernardas Brizgys, Southgate, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Mar. 4, 1974, Ser. No. 447,884
Int. Cl.² C07F *3/12*
U.S. Cl. 260—433 **8 Claims**

1. A liquid monomercury organo catalyst for polyurethanes having the formula



wherein:
A is hydrogen or methyl;
D is hydrogen, methyl, ethyl or propyl;
n is a number from 0 to 6;
provided that the sum of carbon atoms present in A and D is 2 or 3, otherwise both A and D are hydrogen.

3,927,054
PROCESS FOR PRODUCING β-PHENYLSERINE COPPER COMPLEX

Hisao Tobiki, Toyonaka; Tadashi Okamoto, Ashiya, and Hisao Akiyama, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Oct. 5, 1973, Ser. No. 403,906
Int. Cl.² C07F *1/08*
U.S. Cl. 260—438.1 **4 Claims**

1. A process for producing DL-threo-β-p-methylsulfonylphenylserine copper complex which comprises
reacting p-methylsulfonylbenzaldehyde with glycine copper complex in an amount of at least one mole of complex per mole of p-methylsulfonylbenzaldehyde under basic condition
in the presence of a solvent selected from the group consisting of water, a lower alcohol or a mixed solvent of water and a lower alcohol
at a temperature within a range between room temperature and 100° C.

3,927,055
PHOTOSENSITIVE COPPER (I) COMPLEXES

Henry L. Gysling, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 365,376, May 30, 1973, Pat. No. 3,860,501. This application Oct. 25, 1974, Ser. No. 518,657
Int. Cl.² C07F 1/08
U.S. Cl. 260—438.1 **4 Claims**

1. A copper (I) complex having the formula

$$Cu[P(OR)_3]_4BAr_4$$

wherein R is alkyl containing from 1 to 6 carbon atoms or aryl containing from 6 to 12 carbon atoms and Ar is aryl containing from 6 to 12 carbon atoms.

3,927,056
HYDRIDO(NITRILE)TRIS(TRIARYL PHOSPHITE)COBALT COMPLEXES

Lawrence Wayne Gosser, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Apr. 4, 1974, Ser. No. 457,913
Int. Cl.² C07F 15/06
U.S. Cl. 260—439 R **8 Claims**

1. A cobalt hydride complex of the formula $HCo[R(CN)_x][P(OAr)_3]_3$ wherein:

x is 1 or 2;

when x is 1, R is alkyl, alkenyl, aryl or alkaryl of up to 18 carbons;

when x is 2, R is alkylene, alkenylene, arylene or alkarylene of up to 18 carbons, and

the Ar's alike or different, are phenyl or alkylphenyl of up to 18 carbons.

3,927,057
METHOD FOR THE PREPARATION OF ORGANOSILYLAMINES

Minoru Takamizawa; Toshio Shinohara, and Masatoshi Takita, all of Annaka, Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

Filed May 22, 1974, Ser. No. 472,357
Claims priority, application Japan, May 29, 1973, 48-59974
Int. Cl.² C07F 7/8, 7/10, 7/18
U.S. Cl. 260—448.2 E **14 Claims**

1. A method for the preparation of organosilylamines which comprises reacting triorganohalosilanes represented by the general formula $R^1R^2R^3SiX$ where; R^1, R^2 and R^3 are the same or different hydrocarbon groups having 1 to 18 carbon atoms, and X is a halogen atom, with a nitrogen-containing compound selected from the group consisting of ammonia and amines represented by the general formula R^4R^5NH where R^4 and R^5 are selected from the group consisting of hydrogen and monovalent hydrocarbon groups in an inert organic solvent, then after completion of the reaction, contacting the reaction mixture with an aqueous alkali solution containing an alkali hydroxide selected from the group consisting of sodium hydroxide, potassium hydroxide, and lithium hydroxide in an amount in excess of the equivalent amount to the halide salts present in said reaction mixture, dissolving said halide salts in said aqueous alkali solution, and separating said reaction mixture from said aqueous alkali solution.

3,927,058
METHOD OF PRODUCING ALKYLTRIFLUOROSILANE COMPOUNDS

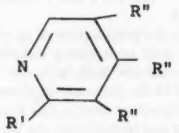
William J. Libbey, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 431,516, Jan. 7, 1974, abandoned, Continuation of Ser. No. 224,961, Feb. 9, 1972, abandoned. This application Feb. 10, 1975, Ser. No. 548,857
Int. Cl.² C07F 7/08, 7/12
U.S. Cl. 260—448.2 E **8 Claims**

1. A method for producing alkyltrifluorosilanes comprising

a. forming a reaction mixture of SiF_4 and an aluminum trialkyl complex; said aluminum trialkyl complex being derived from the addition of a complexing agent to aluminum trialkyl in a molar ratio of 0.4:3/1, respectively; said aluminum trialkyl being defined by AlR_3 wherein each R is an alkyl group containing at least 3 carbon atoms; said complexing agent being tetrahydrofuran; m-dioxane; p-dioxane; triethylenediamine; quinoline; isoquinoline; aliphatic amines of the formula

wherein each R^o is a straight chain alkyl group having 1 to 6 carbon atoms; and cyclic amines of the formula



wherein R′ is hydrogen or methyl, and each R″ is hydrogen or an alkyl group having 1 to 10 carbon atoms provided that any two adjacent R″ groups together with the nuclear carbon atoms to which they are attached may represent a single ring having 5 to 7 carbon atoms; the mole ratio of SiF_4 to aluminum trialkyl content in the complex being at least 3; and

b. subjecting said reaction mixture to reaction at elevated temperatures under a substantially anhydrous and oxygen-free atmosphere.

3,927,059
METHOD OF PRODUCING DIALKYLDIFLUOROSILANE COMPOUNDS

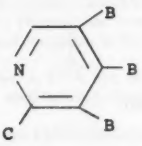
William J. Libbey, and Allan J. Lundeen, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 431,181, Jan. 7, 1974, abandoned, which is a continuation of Ser. No. 235,002, March 15, 1972, abandoned. This application Feb. 10, 1975, Ser. No. 548,858
Int. Cl.² C07F 7/08, 7/12
U.S. Cl. 260—448.2 E **7 Claims**

1. A method for producing dialkyldifluorosilanes comprising

a. forming a reaction mixture of SiF_4 and an aluminum trialkyl complex, said reaction mixture having a molar ratio of SiF_4 to aluminum trialkyl content in the complex of at least 3; said aluminum trialkyl complex being derived from the addition of a complexing agent to aluminum trialkyl in a molar ratio of 0.4–3/1, respectively; said aluminum trialkyl being defined by $Al(R)_3$ wherein each R is an alkyl group containing 3 to 20 carbon atoms; said complexing agent being tetrahydrofuran; m-dioxane; p-dioxane; triethylenediamine; quinoline; isoquinoline; aliphatic amines of the formula

wherein each A is a straight chain alkyl group having 1 to 6 carbon atoms; or cyclic amines of the formula

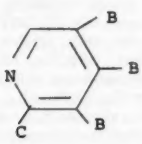


wherein C is hydrogen or methyl, and each B is hydrogen or an alkyl group having 1 to 10 carbon atoms provided that any two adjacent B groups together with the nuclear carbon atoms to which they are attached may represent a single ring having 5 to 7 carbon atoms;

b. subjecting said reaction mixture to reaction at temperatures in the range of 25° to 300°C at pressures of atmospheric to 3000 psi under a substantially anhydrous and oxygen-free atmosphere to form an alkyltrifluorosilane having the formula $RSiF_3$ wherein R is as defined in (a);

c. forming a reaction mixture of the alkyltrifluorosilane of step (b) and an aluminum trialkyl complex or aluminum trialkyl, said reaction mixture having a molar ratio of alkyltrifluorosilane to aluminum trialkyl in the range of 1:0.25–1; said aluminum trialkyl being defined by $Al(R')_3$ wherein each R′ is an alkyl group containing 2 to 20 carbon atoms; said aluminum trialkyl complex being derived from the addition of a complexing agent to the above aluminum trialkyl in a molar ratio of 0.4–3:1, said complexing agent being tetrahydrofuran; m-dioxane; p-dioxane; triethylenediamine; quinoline; isoquinoline; aliphatic amines of the formula

wherein each A is a straight chain alkyl group having 1 to 6 carbon atoms; or cyclic amines of the formula



wherein C is hydrogen or methyl, and each B is hydrogen or an alkyl group having 1 to 10 carbon atoms provided that any two adjacent B groups together with the nuclear carbon atoms to which they are attached may represent a single ring having 5 to 7 carbon atoms;

d. subjecting the reaction mixture of step (c) to reaction at temperatures in the range of 180° to 300°C at pressures of atmospheric to 3000 psi under a substantially anhydrous and oxygen-free atmosphere to form a dialkyldifluorosilane having the formula $R(R')SiF_2$ wherein R is as defined in (a) and R′ is as defined in (c); and

e. recovering the dialkyldifluorosilane.

3,927,060

METHOD OF PRODUCING DIETHYLDIFLUOROSILANE

William J. Libbey, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 431,190, Jan. 7, 1974, abandoned, which is a continuation of Ser. No. 235,003, March 15, 1972, abandoned. This application Feb. 10, 1975, Ser. No. 548,859

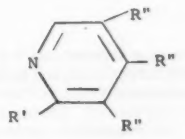
Int. Cl.² C07F 7/08, 7/12

U.S. Cl. 260—448.2 E **5 Claims**

1. A method for producing diethyldifluorosilane comprising

a. forming a reaction mixture of SiF_4 and an aluminum triethyl complex, said reaction mixture having a molar ratio of SiF_4 to aluminum triethyl content in the complex in the range of 0.5–1.6/1, said aluminum triethyl complex being derived from the addition of a complexing agent to aluminum triethyl in a molar ratio of 0.4–3/1, respectively, said complexing agent being tetrahydrofuran; m-dioxane, p-dioxane; triethylenediamine; quinoline; isoquinoline; aliphatic amines of the formula

wherein each R is a straight chain alkyl group having 1 to 6 carbon atoms; and cyclic amines of the formula



wherein R′ is hydrogen or methyl, and each R″ is hydrogen or an alkyl group having 1 to 10 carbon atoms provided that any two adjacent R″ groups together with the nuclear carbon atoms to which they are attached may represent a single ring having 5 to 7 carbon atoms; and

b. subjecting the reaction mixture to reaction at temperatures in the range of 190°–300°C, under a substantially anhydrous, oxygen-free atmosphere, at pressures of up to 3000 psi, with agitation to produce diethyldifluorosilane.

3,927,061

PHOSPHATE-FREE CARBOXYLATE-SULFATE DETERGENTS

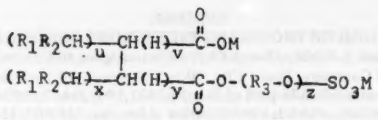
Mitchell Danzik, Pinole, and Ralph House, El Sobrante, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 259,924, June 5, 1972, Pat. No. 3,843,707. This application July 11, 1974, Ser. No. 483,496

Int. Cl.² C07C 141/02

U.S. Cl. 260—458 **4 Claims**

1. A surface active compound of the formula



in which R_1 and R_2 are substantially linear alkyl or alkenyl groups of 3 to 19 carbon atoms, R_3 is alkylene of 2 to 4 carbon atoms, u, v, x and y are 0 or 1, z is an integer 1 to 4, M is H or an alkali metal, alkaline earth metal, or ammonium cation, the sum of the carbon atoms in R_1 and R_2 is 13 to 21, the sum of the unsaturated sites in R_1 and R_2 is 1, the sum of u and v is 1, the sum of x and y is 1, and the sum of u and x is 1.

3,927,062
PLANT GROWTH REGULATORS

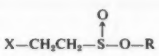
Kurt H. G. Pilgram; Earl K. Jackson, and Willy D. Kollmeyer, all of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 253,356, May 15, 1972, Pat. No. 3,876,678, which is a continuation-in-part of Ser. No. 162,709, July 14, 1971, abandoned. This application Dec. 10, 1974, Ser. No. 531,257

Int. Cl.² C07C *145/00*

U.S. Cl. 260—456 NS **5 Claims**

1. A compound of the formula



wherein X is chlorine or bromine and R is ZR′ in which Z is alkylene of up to 4 carbon atoms and R′ is alkoxy of up to 4 carbon atoms, or hydroxy.

3,927,063
WATER-INSOLUBLE STYRYL DYESTUFFS

Richard Peter, and Hansjoerg Angliker, both of Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

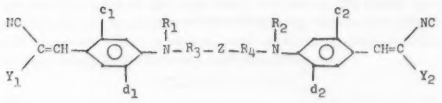
Continuation-in-part of Ser. No. 665,738, Sept. 6, 1967, abandoned. This application May 1, 1970, Ser. No. 33,934

Claims priority, application Switzerland, Sept. 9, 1966, 13089/66

Int. Cl.² C07C *121/78*

U.S. Cl. 260—465 D **5 Claims**

1. A dyestuff of the formula



in which

Y_1 and Y_2 each is cyano, carbamoyl, phenylsulfonyl or -COOR where R is lower alkyl,

c_1, c_2, d_1 and d_2 each independently is hydrogen, halogen, lower alkyl, lower alkoxy, thioophenoxy or phenoxy, and c_1 and c_2 can each independently also be CF_3, lower alkanoylamino, lower alkylsulfonyl, lower alkylsulfonamido,

R_1 and R_2 each independently is hydrogen, lower alkyl, and lower alkyl substituted by phenyl, halogen, cyano, lower alkoxy, hydroxy, lower alkanoyloxy, lower alkanoylamino, lower alkylcarbamoyloxy, phenoxy, cyanoloweralkoxy, and lower alkoxycarbonyl,

R_3 and R_4 each independently is alkylene, alkanoyloxyalkylene, alkylcarbamoyloxyalkylene, alkoxyalkylene or hydroxyalkylene, each containing up to 6 carbon atoms

Z is —O—R_5—O—where R_5 is phenylene or C_2–C_4 alkylene, or Z is —O—or

where R_7 is lower alkyl.

3,927,064
BENZYLIDENE-AMINOBENZONITRILES

Arthur Boller, Binningen, and Hanspeter Scherrer, Therwil, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

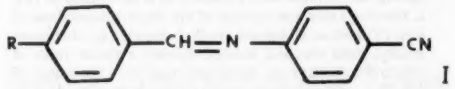
Filed Feb. 21, 1973, Ser. No. 334,292

Claims priority, application Switzerland, Feb. 23, 1972, 2585/72; Jan. 11, 1973, 355/73

Int. Cl.² C07C *121/78*

U.S. Cl. 260—465 E **9 Claims**

1. A compound of the formula



wherein R is ethyl, n-propyl, n-butyl, n-pentyl, n-hexyl, isohexyl, n-heptyl or n-octyl.

3,927,065
DISPERSE BISANIL DYES DERIVED FROM DIAMINOMALEONITRILE AND THEIR PREPARATION

John Fred Neumer, Hockessin, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jan. 3, 1974, Ser. No. 430,416

Int. Cl.² C07C *119/00;* **C07D** *333/04, 209/14*

U.S. Cl. 260—465 E **36 Claims**

1. Bisanil dye of the formula

$$Ar_1—CH=N—C(CN)=C(CN)—N=CH—Ar_2$$

wherein each of Ar_1 and Ar_2 is independently selected from phenyl and naphthyl groups containing 0–3 substituents selected from NO_2, halogen, CN, C_{1-4} alkyl, C_{1-4} alkoxy, OCH_2-phenyl, phenyl, CF_3, OH, OC_{1-4} alkylene-$N(C_{1-4}$ alkyl$)_2$, C_{2-4} alkylene-Cl, $NHCONH_2$, NHCOA, $NHSO_2A$, SR_8, SO_2R_8, NHR_1, $NHCOC_{1-4}$ alkylene-B and -NR_1R_2 wherein:

a. R_1 is C_{1-4} alkyl or C_{2-4} alkylene-R_3;

b. R_2 is C_{1-4} alkyl, C_{2-4} alkylene-R_4 or, if Ar_1 or Ar_2 is phenyl, C_3 alkylene attached to a phenyl position which is ortho to the position to which the nitrogen is attached;

c. R_3 is CN, halogen, OH, phenyl, C_{1-4} alkoxy, OC_{1-4} alkylene-CN, CO_2A, OCOA, OCONHA or CO_2C_{1-4} alkylene-OCOA;

d. R_4 is CN, halogen, OH, phenyl, OC_{1-4} alkylene-CN, CO_2A, OCOA, CO_2C_{1-4} alkylene-OCOA, SO_2A, phthalimido, succinimido, glutarimido, $OCOCH=CH_2$, CH_2-$CH(OCOA)CH_2OA$ or $CH_2CH(OCONHA)CH_2OA$;

e. A is C_{1-4} alkyl or R_5;

f. B is halogen, C_{1-4} alkoxy or R_5;

g. R_8 is phenyl containing 0–2 substituents selected from C_{1-4} alkyl, C_{1-4} alkoxy, halogen, NO_2, CN, C_{1-4} alkyl-CONH and NR_6R_7 wherein each of R_6 and R_7 is independently selected from H and C_{1-4} alkyl, with at least one of

R_6 and R_7 being C_{1-4} alkyl; and
h. R_8 is C_{1-4} alkyl, C_2H_4OH, C_{5-6} cycloalkyl or R_5.

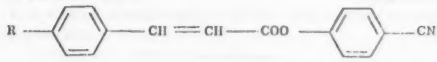
3,927,066

LIQUID CRYSTALLINE CINNAMIC ACID ESTERS

Hanspeter Scherrer, Therwil, and Arthur Boller, Binningen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 4, 1974, Ser. No. 529,436
Claims priority, application Switzerland, Dec. 17, 1973, 17626/73
Int. Cl.² C07C *121/60*
U.S. Cl. 260—465 D 18 Claims

1. A cinnamic acid ester of the formula



wherein R is straight-chain alkyl of 1 to 8 carbon atoms.

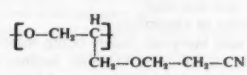
3,927,067

POLYOLS CONTAINING CYANOALKYL ETHER GROUPS

Stephen E. Cantor, and Thomas J. Brett, Jr., both of Cheshire, Conn., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 227,647, Feb. 18, 1972, Pat. No. 3,816,425. This application Feb. 25, 1974, Ser. No. 445,728
Int. Cl.² C07C *121/34*
U.S. Cl. 260—465.6 4 Claims

1. A polyol having a molecular weight of from 250 to 4500, an hydroxyl number of from 25 to 600, a cyano content of from 1 to 20% by weight, and containing a group having the structure of the formula



said polyol being formed by polymerizing cyanoethyl glycidyl ether in an inert, non-polar organic solvent in the presence of boron trifluoride, etherate catalyst and an initiator selected from the group consisting of ethylene glycol and propylene glycol and, optionally, tetrahydrofuran, the combined molar ratio of cyanoethyl glycidyl ether and tetrahydrofuran to said catalyst being from 7.9 to 43:1, said polymerization comprising the steps of

a. adding cyanoethyl glycidyl ether and said initiator to said solvent,
b. adjusting the mixture of (a) to a temperature of from −20° to +20°C.,
c. adding a solution of said catalyst while stirring,
d. maintaining the reaction profile mixture over a period of from 4 to 30 hours at the above temperature, and at a pressure of from 1 to 2 atmospheres,
e. deactivating the catalyst, and
f. recovering the polyol from the reaction mixture.

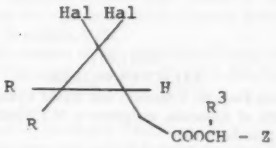
3,927,068

PESTICIDAL CYCLOPROPANE DERIVATIVES

Robert J. G. Searle, Rodmersham Green, near Sittingbourne, and Roger E. Woodall, Borden, near Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 15, 1974, Ser. No. 442,994
Claims priority, application United Kingdom, Feb. 16, 1973, 7685/73
Int. Cl.² C07C *69/74*
U.S. Cl. 260—468 H 10 Claims

1. A cyclopropane derivative of the formula:



wherein each R represents alkyl of 1 to 6 carbon atoms; each Hal represents a halogen atom; R^3 represents alkyl, cycloalkyl, cyanoalkyl or alkenyl of up to 6 carbon atoms, alkynyl of up to 8 carbon atoms, or a phenyl group; and Z represents phenoxyphenyl or propynyloxyphenyl.

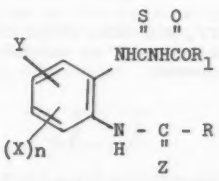
3,927,069

ALKYL 4-[O-(SUBSTITUTED AMINO)PHENYL]-3-THIOALLOPHANATES

Charles D. Adams, Newark, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Oct. 13, 1969, Ser. No. 865,984
Int. Cl.² C07C *157/09*
U.S. Cl. 260—470 6 Claims

1. A compound of the formula:



wherein
X is hydrogen, fluorine, chlorine, or bromine;
Y is hydrogen or alkyl of 1 to 4 carbon atoms;
R_1 is alkyl of 1 to 12 carbon atoms;
Z is oxygen, or sulfur
R is

R_2 is hydrogen or methyl;
R_3 is hydrogen or alkyl of 1 to 4 carbon atoms;
When Y is alkyl, *n* is 0 and when Y is hydrogen, *n* is 1, 2, or 3; and the sodium, potassium, lithium, calcium, barium, copper, zinc and manganese salts of these compounds.

3,927,070

M-(3,3-DISUBSTITUTED UREIDO) PHENYL [(SUBSTITUTED)METHYL] CARBAMATES

Karoly Szabo, Stiegengasse 4/16, A-1060 Vienna, Austria

Filed May 8, 1972, Ser. No. 251,481
Int. Cl.² C07C 127/19
U.S. Cl. 260—479 C 5 Claims

1. A compound: m-(3-methoxy-3-methyl ureido)phenyl [(methoxy)methyl]carbamate.

3,927,071

SALICYLANILIDES

Bruce Adam Forsyth, Croydon, and David Ernest Pryor, Balwyn, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Apr. 30, 1973, Ser. No. 355,813
Claims priority, application Australia, May 12, 1972, 8942/72; Aug. 3, 1972, 9940/72; Dec. 5, 1972, 1505/72
Int. Cl.² C07C 103/76, 69/14
U.S. Cl. 260—479 R 2 Claims

1. A compound 3,5-diiodo-2'-trifluoromethyl-4'-chlorosalicylanilide.

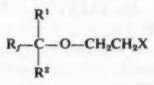
3,927,072

FLUORINATED β-(ALKOXY)-PROPIONATES

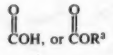
Adrian Samuel Fox, Lower Providence, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 4, 1974, Ser. No. 439,510
Int. Cl.² C07C 69/66
U.S. Cl. 260—484 R 9 Claims

1. A compound of the fomula



wherein R_f is CF_3, CF_3CFHCF_2, or $H(CF_2CF_2)_n$ where n is an integer of 1 to 3; R^1 and R^2 are independently hydrogen or CH_3; and X represents



where R^3 is alkyl or alkylene having 1 to 8 carbon atoms.

3,927,073

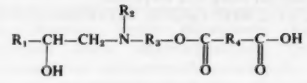
ESTERS OF DICARBOXYLIC ACIDS AND POLYHYDROXY TERTIARY AMINES AS NEW DETERGENT SOFTENER COMPOUNDS

Bjorn Sundby, Piscataway, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 205,408, Dec. 6, 1971, abandoned. This application Oct. 24, 1973, Ser. No. 409,027
Int. Cl.² C07C 69/44, 69/60, 69/76
U.S. Cl. 260—485 G 3 Claims

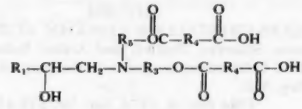
1. A compound having in the free acid form a formula selected from the group consisting of

(A)



and

(B)



and mixtures of (A) and (B)
wherein

1. R_1 is C_8 to $C_{24\ alkyl}$,
2. R_2 is C_1 to C_6 alkyl or C_2–C_6 alkylol,
3. R_3 and R_5 are alkylene of C_2 to C_8, and
4. R_4 represents the residue of a dicarboxylic acid and selected from the group consisting of maleic, succinic, glutaric, tartaric, malic, adipic, diphenic and naphthalic acids.

3,927,074

PREPARATION OF HALOBUTYRATE ESTERS

John A. Wojtowicz, Chesire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed June 19, 1974, Ser. No. 476,347
Int. Cl.² C07C 69/63
U.S. Cl. 260—487 9 Claims

1. A method for preparing halobutyrate esters of the formula X—CH_2—CH_2—CH_2—COOR, wherein R is an alkyl group of 1 to 4 carbon atoms and X is a halogen selected from the group consisting of chlorine, bromine, iodine and fluorine, consisting essentially of reacting γ-butyrolactone with from about 1 to about 2 moles of an inorganic halide, per mole of γ-butyrolactone, in the presence of from about 1 to about 10 moles of an alkanol having 1 to 4 carbon atoms, per mole of γ-butyrolactone, at a temperature of about 10° to about 150°C. and a pressure of about 0.1 to about 10 atmospheres, the inorganic halide being selected from the group consisting of:

a. the halides and oxyhalides of sulfur, phosphorous, arsenic, antimony, bismuth, selenium, and tellurium;
b. the halides of boron, silicon, germanium, titanium, tin, aluminum, and iron and
c. the oxyhalides of chromium

the halogen in said inorganic halide being selected from the group consisting of chlorine, bromine, iodine, and fluorine with the proviso that when aluminum and iron are used, said halogen is selected from the group consisting of chlorine, bromine, and iodine.

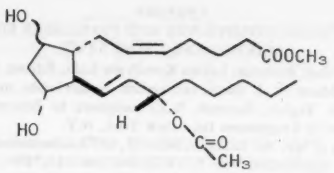
3,927,075

$PGF_2\alpha$ AND $PGF_2\beta$, 15-ACETATE, METHYL ESTERS

John E. Pike, and William P. Schneider, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 159,478, July 2, 1971, Pat. No. 3,772,350, which is a continuation-in-part of Ser. No. 71,390, Sept. 11, 1970, abandoned. This application Oct. 25, 1973, Ser. No. 404,962
Int. Cl.² C07C 177/00
U.S. Cl. 260—488 R 3 Claims

1. A compound of the formula



wherein ~ indicates attachment to the ring in alpha or beta configuration.

3,927,076

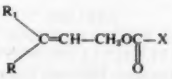
METHOD OF REARRANGING TERTIARY VINYL CARBINOLS

James H. Babler, Evanston, Ill., assignor to Research Corporation, New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,450
Int. Cl.² C07C *29/00, 67/08*
U.S. Cl. 260—488 R **9 Claims**

1. A method of rearranging a tertiary vinyl carbinol having the structure:

comprising reacting said vinyl carbinol with a liquid lower alkanoic acid, anhydride thereof or a mixture thereof at from about 0°C to about room temperature in the presence of a catalytic amount of a strong acid having an ionization constant above about 1×10^{-4} for a time sufficient to produce a rearranged compound having the structure:



substantially uncontaminated with non-rearranged compound wherein:

R and R_1, which may be the same or different, represent alkyl, vinyl, phenyl, cycloalkyl, cycloalkenyl, lower alkylphenyl, lower alkylcycloalkyl, lower alkylcycloalkyenyl or taken together with the carbon atom to which they are attached form a cycloalkyl group, all being optionally substituted with halogen and

X is the lower alkyl residue of said lower alkanoic acid.

3,927,077

ANHYDRIDES TO IMPROVE OXIDATIVE COUPLING REACTIONS

Herman L. Finkbeiner, Rexford, and John B. Bush, Jr., Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 274,670, July 24, 1972, Pat. No. 3,845,116, which is a continuation-in-part of Ser. No. 814,157, April 7, 1969, which is a continuation-in-part of Ser. No. 742,544, July 5, 1968, abandoned. This application July 18, 1974, Ser. No. 489,679
Int. Cl.² C07C *67/00*
U.S. Cl. 260—488 R **3 Claims**

1. The process whereby a C_{3-3} alkanoic acid selected from the group consisting of acetic acid and propionic acid is coupled through the α-carbon atom to a C_{3-8} alkane or cycloalkane having at least one carbon atom that has one but not more than two hydrogens to produce an ester using a manganic salt of the alkanoic acid as an oxidative coupling agent, said process being carried out in the presence of a sufficient amount of the anhydride of the alkanoic acid present as the reactant to provide an excess over the amount required to react with any water present in the initial reaction mixture.

3,927,078

METHYLENE AND OXYMETHYLENE BIS-ESTER PRODUCTION

Seymour J. Lapporte, Orinda, and William G. Toland, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 282,623, Aug. 21, 1972, abandoned. This application Sept. 19, 1973, Ser. No. 398,732
Int. Cl.² C07C *67/36*
U.S. Cl. 260—494 **15 Claims**

1. A process for producing methylene and oxymethylene di- or bis-esters by reacting in liquid phase or gaseous phase

1. a carboxylic acid ester of the formula $R^2CO_2R^1$, wherein R^1 is alkyl of 1 to 10 carbon atoms and R^2 is hydrogen, alkyl of 1 to 10 carbon atoms, phenyl, alkylphenyl of 7 to 10 carbon atoms or phenylalkyl of 7 to 10 carbon atoms,
2. formaldehyde, and
3. carbon monoxide in the presence of a catalytic amount of a transition metal compound selected from a rhodium compound and a palladium compound, an iodide or bromide promoter and a proton donor which is water or a Bronsted acid, the molar ratio of carboxylic acid ester to carbon monoxide being from about 10:1 to 1:10, the molar ratio of formaldehyde to carboxylic acid ester being from 1:1.5 to 5:1, at a temperature of about 50°C to 300°C and at an initial carbon monoxide pressure of from 1 psia to 5000 psia.

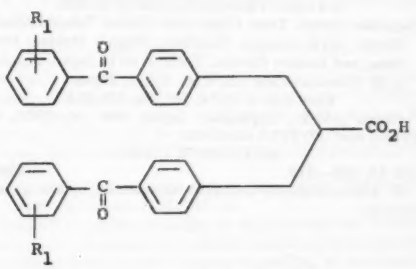
3,927,079

BIS-SUBSTITUTED OR UNSUBSTITUTED-P-BENZOYLBENZYL ACETIC ACIDS

William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Filed Feb. 25, 1974, Ser. No. 445,266
Int. Cl.² C07C *65/20*
U.S. Cl. 260—501.1 **3 Claims**

1. A compound of the formula



where

R_1 represents hydrogen, halo having an atomic weight of about 19 to 36 or straight chain lower alkoxy,

or a pharmaceutically acceptable salt thereof.

3. The compound of claim 1 which is bis-(p-benzoylbenzyl-)acetic acid methylamine salt.

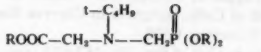
3,927,080

PROCESS FOR PRODUCING N-PHOSPHONOMETHYL GLYCINE

Van R. Gaertner, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 3, 1974, Ser. No. 502,706
Int. Cl.² C07F 9/38
U.S. Cl. 260—502.5 6 Claims

1. A process for producing N-(phosphonomethyl)glycine which comprises forming an admixture of N-t-butyl-N-(phosphonomethyl)glycine compound of the formula



wherein each R is individually hydrogen or an organic group containing up to 18 carbon atoms, with an aqueous hydrohalic acid consisting of hydrochloric, hydrobromic or hydriodic, the concentration of said aqueous hydrohalic acid being at least 20% by weight and heating said admixture to a temperature sufficiently elevated so as to remove said t-butyl group.

3,927,081

PURIFICATION OF CRUDE SULFONIC ACIDS

Samuel Charles Thomas, Jr., Prospect Park, and Vincent Jay Cease, Aston, both of Pa., assignors to Continental Oil Company, Ponca City, Okla.

Filed Feb. 26, 1973, Ser. No. 333,857
Int. Cl.² C07C 143/24
U.S. Cl. 260—505 P 12 Claims

1. A method for purifying crude oil-soluble sulfonic acids, whereby sulfuric acid and sulfur oxides are removed therefrom, wherein the method comprises contacting a volatile, non-aromatic hydrocarbon solution of crude oil-soluble sulfonic acids with an effective amount, in the range of from about 0.25 to about 5 volume percent, based on the hydrocarbon solution of crude sulfonic acid, of 2-methoxyethanol or a mixture of 2-methoxyethanol and water which mixture contains from about 15 to about 85 volume percent 2-methoxyethanol, said volatile hydrocarbon boiling below about 150°C.

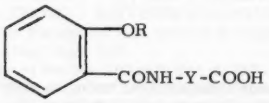
3,927,082

2-ALKOXYBENZOYLAMINO ACIDS

Tatsuhiko Katori, Tone; Giichi Sato, Chiba; Takashi Kihara, Narita; Norio Yumoto, Tomisato; Shigeru Makino, Narashino, and Juntaro Harada, Yachiyo, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Feb. 5, 1974, Ser. No. 439,693
Claims priority, application Japan, Feb. 14, 1973, 48-17483; Apr. 17, 1973, 48-43451
Int. Cl.² C07C 103/22
U.S. Cl. 260—519 6 Claims

1. Alkoxybenzoylamino acid represented by the general formula:



wherein R represents an alkyl group having 5 to 12 carbon atoms, and Y represents a methylene or propylene group.

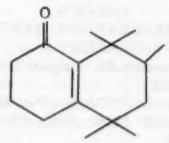
3,927,083

BICYCLIC COMPOUNDS AND PROCESSES FOR MAKING AND USING SAME

John B. Hall, Rumson; Lekhu Kewalram Lala, Edison, both of N.J.; Muus G. J. Beets, Hilversum, Netherlands, and William I. Taylor, Summit, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 263,219, June 15, 1972, abandoned. This application Nov. 1, 1973, Ser. No. 411,789
Int. Cl.² A61K 7/46
U.S. Cl. 252—522 4 Claims

1. A perfume composition containing as an essential fragrance ingredient 1,2,3,4,5,6,7,8-octahydro-1,1,2,4,4-pentamethyl-8-naphthalenone having the formula



and an auxiliary perfume adjuvant selected from the group consisting of perfume modifiers, fixatives and top-notes.

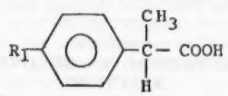
3,927,084

PROCESS FOR THE PRODUCTION OF 2(4-ALKYLPHENYL)PROPIONIC ACID

Katsura Kogure, Kawagoe; Hiroyasu Koyama, Ohi, and Kunio Nakagawa, Kawagoe, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

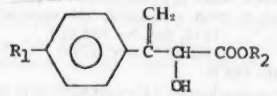
Filed Jan. 25, 1974, Ser. No. 436,632
Claims priority, application Japan, Jan. 29, 1973, 48-11164; Jan. 29, 1973, 48-11165
Int. Cl.² C07C 51/26
U.S. Cl. 260—523 A 8 Claims

1. A process for preparing a 2-(4-alkylphenyl-propionic acid of the formula

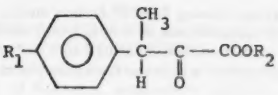


wherein R_1 is alkyl of 2–4 carbon atoms, or a pharmaceutically acceptable salt thereof, which comprises:

a. reacting a 2-hydroxy-3-(4-alkylphenyl)-3-butenoic acid ester of the formula

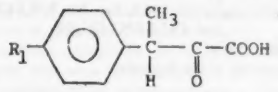


wherein R_1 has the above-indicated values and R_2 is alkyl of 1–3 carbon atoms, with an alkali metal alcoholate of 1–4 carbon atoms dissolved in an alkanol of 1–4 carbon atoms to form a 3-methyl-3-(4-alkylphenyl)-pyruvate of the formula



wherein R_1 and R_2 have the above-indicated values;

b. hydrolyzing the resultant pyruvate under alkaline hydrolysis conditions to form a 3-methyl-3-(4-alkylphenyl)-pyruvic acid of the formula



wherein R_1 has the above-indicate values, or a salt thereof; and

c. oxidizing the resultant acid or a salt thereof with aqueous alkaline hydrogen peroxide to form said 2-(4-alkylphenyl)-propionic acid or said salt thereof.

3,927,085

PROCESS FOR THE PRODUCTION OF A MERCAPTOCARBOXYLIC ACID

Hans-Georg Zengel, Kleinwallstadt; Anton Toth, Obernburg; Helmut Magerlein, Obernburg, and Gerhard Meyer, Obernburg, all of Germany, assignors to Akzo N. V., Arnhem, Netherlands

Filed Oct. 15, 1974, Ser. No. 514,463

Claims priority, application Germany, Oct. 29, 1973, 2354098

Int. Cl.² C07C *148/00*

U.S. Cl. 260—526 S **9 Claims**

1. A process for the production of mercaptoacetic acid or β-mercaptopropionic acid which comprises reacting hydrogen sulfide at a partial pressure of at least 2 atm. and at a temperature of about 60°C. to 140°C. in admixture with an aqueous solution of a chlorocarboxylic acid of the formula $Cl-(CH_2-)_n-COOH$ or the corresponding ammonium or sodium salt thereof, *n* being the integer 1 or 2, in the presence of aqueous ammonium or sodium hydroxide and subsequently acidifying the reaction product, the initial reaction mixture consisting essentially of said chlorocarboxylic acid or said salt thereof in water in a concentration amounting to about 4.0 – 12 mol percent.

3,927,086

THIOUREIDO SULFONANILIDE COMPOSITIONS

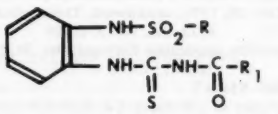
Alexander Mihailovski, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 217,697, Dec. 29, 1971, Pat. No. 3,832,384. This application June 12, 1974, Ser. No. 478,490

Int. Cl.² C07C *143/833*

U.S. Cl. 260—552 R **9 Claims**

1. Compounds corresponding to the generic formula:



wherein R can be selected from lower alkyl, lower haloalkyl, phenyl, substituted phenyl wherein said substituents can be selected from halogen and lower alkyl; and R_1 is lower alkyl.

3,927,087

NEW THIOUREA DERIVATIVES

Dieter Dürr, Bottmingen, and Marcus von Orelli, Munchenstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

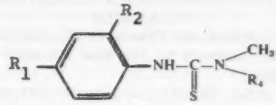
Filed July 16, 1973, Ser. No. 379,536

Claims priority, application Switzerland, July 24, 1972, 11003/72

Int. Cl.² C07C *157/02*

U.S. Cl. 260—552 R **11 Claims**

1. A thioruea of the formula



wherein

R_1 represents halogen or methyl,

R_3 represents C_1–C_4 alkyl, and

R_4 represents C_2–C_5 alkyl.

3,927,088

SULFONYL UREAS AND PROCESS FOR PREPARING THEM

Helmut Weber, Frankfurt am Main; Walter Aumuller, Kelkheim, Taunus; Rudi Weyer, Frankfurt am Main; Karl Muth, Kelkheim, Taunus, and Volker Hitzel, Lorsbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 20, 1972, Ser. No. 308,002

Claims priority, application Germany, Nov. 20, 1971, 2157607

Int. Cl.² C07C *127/16*

U.S. Cl. 260—553 DA **1 Claim**

1. N-[4-(β-<5-chloro-2-methoxy-benzamido>-ethyl)-benzenesulfonyl]-N'-cyclopentyl-methyl-urea.

3,927,089

PROCESS FOR THE MANUFACTURE OF LOW MOLECULAR REACTIVE SURFACE-ACTIVE AGENTS FROM CARBAMIDES

Luzius Schibler, Riehen, and Jurg Merz, Therwil, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Mar. 26, 1973, Ser. No. 344,820

Claims priority, application Switzerland, Mar. 28, 1972, 4633/72

Int. Cl.² C07C *127/16*

U.S. Cl. 260—553 R **8 Claims**

1. A process for the manufacture of reactive surface-active compounds of the formula

$$R-O-CH_2-NH-CO-NH-CH_2-O-X$$

wherein R represents alkyl or alkenyl each with 6 to 22 carbon atoms, cycloalkyl with 8 to 14 carbon atoms, alkylcyclohexyl or alkylphenyl each with 2 to 12 carbon atoms in the alkyl part, and X represents the residue of a polyalkylene glycol of average molecular weight at most 2000, which comprises the steps of,

a. etherifying or transetherifying a compound of the formula $H_2N-CO-NH-CH_2-O-Z$

wherein X represents hydrogen or alkyl having 4 to 7 carbon atoms, with a hydrophobic hydroxy compound of the formula R—OH or a hydrophilic hydroxy compound of the formula X—OH, thereafter

b. introducing a second methylol group into the resulting monomethylolether compound by reaction with formaldehyde, trioxane, paraformaldehyde or hexamethylenetetramine in dilute alcoholic alkaline solution at temperatures of 40° to 100°C, and

c. etherifying this product with a compound X—OH or R—OH to obtain an end product of the above formula,

wherein X and R have the same meaning given above and wherein steps (a) and (c) are carried out in the presence of an alkane carboxylic acid with 1 to 3 carbon atoms at a temperature of 80° to 120°C and a pressure of 1 to 30 mm Hg.

3,927,090
1,1-DIHALO-1-(METHYLSUFONYL)METHANESULFONAMIDES

Christian T. Goralski, and Thomas C. Klingler, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 322,434, Jan. 10, 1973, Pat. No. 3,865,822. This application Apr. 1, 1974, Ser. No. 456,942
Int. Cl.² C07C *143/75*
U.S. Cl. 260—556 A **4 Claims**

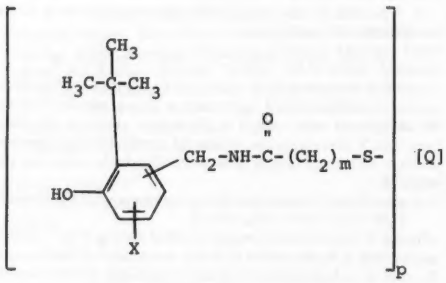
1. A compound represented by the formula $CH_3SO_2CX_2SO_2NR_1R_2$ wherein X represents chloro or bromo and R_1 and R_2 independently represent hydrogen, 1 to 16 carbon atom alkyl, phenyl or substituted phenyl having lower alkyl, of 1 to 4 carbon atoms, lower alkoxy of 1 to 4 carbon atoms, chloro or bromo substitution at least one of which is phenyl or substituted phenyl.

3,927,091
CARBOXYLIC ACID AMIDES

Helmut Huber-Emden; Karl Eschle, both of Basel, and Arthur Maeder, Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 737,832, June 18, 1968, abandoned. This application Sept. 4, 1970, Ser. No. 69,886
Claims priority, application Switzerland, June 23, 1967, 8947/67
Int. Cl.² C07C *103/38*
U.S. Cl. 260—559 T **10 Claims**

1. Carboxylic acid amide of the formula



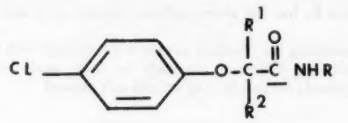
in which X is methyl or tertiary butyl, m is the integer 1 or 2, O is alkylidene having 1 to 20 carbon atoms, cycloalkylidene having 5 or 6 carbon atoms, methylene substituted by phenyl or furyl, alkylene having 1 to 10 carbon atoms, alkenylene having 1 to 6 carbon atoms, or a 3, 4, 5 or 6 valent saturated aliphatic hydrocarbon radical having 1 to 6 carbon atoms and p is an integer which is equal to the valency of the radical.

3,927,092
AMIDES OF 2-[HALOPHENOXY (OR HALOPHENYLTHIO)]-ALKANOIC ACIDS

William A. Bolhofer, Frederick, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed June 24, 1968, Ser. No. 739,147
Int. Cl.² C07C *103/82*
U.S. Cl. 260—559 B **3 Claims**

1. A compound of the formula:



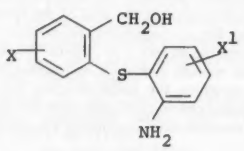
wherein R is N^1,N^1-diloweralkylamidino or N^1-loweralkylamidino and R^1 and R^2 are lower alkyl.

3,927,093
2-(O-AMINOPHENYLTHIO)BENZYL ALCOHOLS

Harry Louis Yale, New Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 296,508, Oct. 10, 1972, abandoned. This application Sept. 30, 1974, Ser. No. 510,856
Int. Cl.² C07C *91/40*
U.S. Cl. 260—571 **3 Claims**

1. A compound of the formula:



wherein X is selected from the group consisting of hydrogen, chlorine, and methoxy and X^1 is selected from the group consisting of chlorine and trifluoromethyl; and pharmaceutically acceptable acid addition salts thereof.

3,927,094
ALKALI METAL POLYMETAPHOSPHATE COMPLEXES OF DOXYCYCLINE AND PREPARATION THEREOF

Ivan Villax, Travessa do Ferreiro, 3, Lisbon 3, Portugal

Continuation-in-part of Ser. No. 353,528, April 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 194,049, Oct. 29, 1971, abandoned. This application July 3, 1973, Ser. No. 376,149
Claims priority, application Portugal, Oct. 30, 1970, 54708
Int. Cl.² C07C *103/19*
U.S. Cl. 260—559 AT **16 Claims**

1. A complex of α-6-deoxy-5-hydroxytetracycline and an alkali metal salt of polymetaphosphoric acid having at least one free acid group, said α-6-deoxy-5-hydroxytetracycline being present in 1 to 5 moles per mole of complex, and said complex having a solubility in water of 4.5 to about 300 mg/ml.

3,927,095

PRODUCTION OF AURAMINE SALTS AND AURAMINE SALT SOLUTIONS

Manfred Eisert, Ludwigshafen, and Karl Schmeidl, Frankenthal, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 12, 1973, Ser. No. 378,775

Claims priority, application Germany, July 15, 1972, 2234836; Nov. 29, 1972, 2258344; Dec. 14, 1972, 2261064

Int. Cl.² C07C *119/00*

U.S. Cl. 260—566 R 6 Claims

1. In a process for the production of methyl auramine or ethyl auramine or solutions thereof by reaction of 4,4′-bisdimethylaminodiphenylmethane or 4,4′-bisdiethylaminodiphenylmethane with urea in the presence of sulfur with or without the addition of an ammonium salt to form a crude auramine melt, the improvement which comprises:

liberating the free auramine base by drowning the crude melt in an aqueous alkaline solution;

taking up said auramine base in an organic water-immiscible solvent added to said aqueous alkaline solution used for drowning the crude melt; and extracting said solvent with an acid containing water, formamide or glycol with the formation of an auramine salt, said acid being selected from the group consisting of sulfuric acid, hydrochloric acid and a low molecular weight carboxylic acid and with the proviso that the solvent (when using the acid in formamide or glycol) is not miscible with the latter.

3,927,096

SUBSTITUTED BENZYLIDENEAMINO GUANIDINES

William J. Houlihan, and Robert E. Manning, both of Mountain Lakes, N.J., assignors to Sandoz Inc., East Hanover, N.J.

Division of Ser. No. 765,739, Aug. 16, 1968, Pat. No. 3,637,849. This application Aug. 5, 1971, Ser. No. 169,555

Int. Cl.² C07C *133/12*

U.S. Cl. 260—564 F 1 Claim

1. 1-amino-3-hydroxy-3-methylguanidine or hydrohalide acid addition salts thereof.

3,927,097

2-THIOPSEUDOUREAS

Asbjorn Baklien, Kingsbury, and Jan Kolm, Kew, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

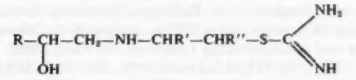
Division of Ser. No. 565,092, July 14, 1966, Pat. No. 3,759,937. This application Dec. 8, 1971, Ser. No. 206,155

Claims priority, application Australia, July 19, 1965, 61653/65; July 26, 1965, 61931/65; Aug. 31, 1965, 63415/65; Sept. 8, 1965, 63786/65

Int. Cl.² C07C *123/00*

U.S. Cl. 260—564 E 3 Claims

1. A compound of the formula



or a salt thereof of a pharmaceutically acceptable acid wherein R is phenyl, 2- or 3- or 4-chlorophenyl, 3-bromophenyl, 4-fluorophenyl, 2-nitrophenyl, 3-nitrophenyl, 4-nitrophenyl, 4-tolyl, 3-trifluoromethylphenyl or 2,3,4-trichlorophenyl and R′ and R″ are hydrogen.

3,927,098

PROCESS FOR THE PREPARATION OF 2-AMINO-4-NITRO-ANISOLE

Bernhard Spiess, Offenbach (Main), Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 12, 1973, Ser. No. 414,633

Claims priority, application Germany, Nov. 16, 1972, 2256169

Int. Cl.² C07C *91/40*, *91/42*, *93/14*

U.S. Cl. 260—575 1 Claim

1. In the process for the preparation of 2-amino-4-nitroanisole by nitration of 2-aminoanisole with subsequent isolation of the 2-aminoanisole by means of a base, the improvement which comprises diluting the nitration mixture with water after the nitration process, heating the diluted solution to about 50°–100°C, subsequently adjusting the solution with ammonia to a pH value of 0.6 to 1.6 and isolating the 2-amino-4-nitroanisole after clarifying filtration without intermediate isolation of an intermediate salt.

3,927,099

PROCESS OF PREPARING CATALYST FREE AROMATIC DIAMINES

William S. Hollingshead, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 1, 1974, Ser. No. 519,968

Int. Cl.² C07C *87/28*, *87/50*

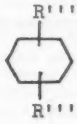
U.S. Cl. 260—576 3 Claims

1. In the process of preparing aromatic diamines comprising reacting

(1) a primary amine having the structural formula

$$R - NH_2$$

wherein R is selected from the group consisting of primary alkyl radicals containing from 1 to 20 carbon atoms, secondary alkyl radical containing from 1 to 20 carbon atoms, aralkyl radical containing from 7 to 12 carbon atoms, cycloalkyl radical containing from 5 to 8 carbon atoms, and aryl radical conforming to the following structure



wherein R′′′ and R′′′′ are selected from the group consisting of hydrogen, primary alkyl radicals containing from 1 to 20 carbon atoms, secondary alkyl radicals containing from 1 to 20 carbon atoms, aralkyl radicals containing from 7 to 12 carbon atoms, cycloalkyl radicals containing from 5 to 8 carbon atoms and alkoxy radicals containing from 1 to 9 carbon atoms with

(2) a polyhydroxy aromatic compound selected from the group consisting of hydroquinones, resorcinols and catechols at a temperature between 100° and 350° C. in the presence of an iron halide condensation catalyst, the improvement

which comprises adding calcium hydroxide in dry form to the hot reaction mixture in an amount sufficient to precipitate essentially all of said iron in the form of an insoluble iron salt and thereafter filtering the molten reaction mixture to remove said insoluble iron salt from the resulting diamine.

3,927,100
PROCESS FOR PRODUCING AMINO PHENYL IODOMETHYL SULFONES

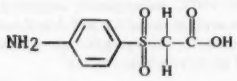
Aldo Joseph Crovetti, Lake Forest; Artur Blank, and Richard Paul Germann, both of Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 215,956, Dec. 20, 1971, abandoned, which is a division of Ser. No. 845,097, July 25, 1969, Pat. No. 3,657,353. This application Feb. 25, 1974, Ser. No. 445,715

Int. Cl.² C07C *147/13*

U.S. Cl. 260—578 **5 Claims**

1. A method of iodinating a sulfonyl acetic acid of the formula



comprising adding the sulfonyl acetic acid to be iodinated to glacial acetic acid, buffering the mixture to a pH of between 2.5 and 6 by addition thereto of a basic compound selected from the group consisting of sodium hydroxide, ammonium hydroxide and dibasic ammonium phosphate, adding iodine to the mixture and stirring at a temperature of from 12° to 25°C. until the iodine is in solution, bubbling one mole of chlorine per mole of acid into the reaction mixture until precipitation of the desired product stops and evolution of carbon dioxide ceases, and recovering the iodinated product.

3,927,101
PROCESS FOR THE PREPARATION OF HYDROXYLAMINES BY HYDROGENATION OF AROMATIC NITRO DERIVATIVES

Joel Le Ludec, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

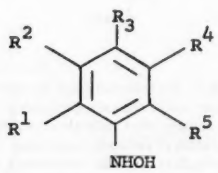
Continuation-in-part of Ser. No. 364,757, May 29, 1973. This application Jan. 15, 1974, Ser. No. 433,560

Claims priority, application France, Nov. 21, 1973, 73.41444

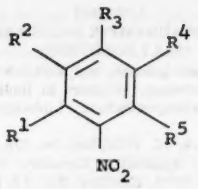
Int. Cl.² C07C *83/02*

U.S. Cl. 260—580 **6 Claims**

1. In a process for the preparation of an aromatic hydroxylamine of the formula:



in which each of R^1, R^2, R^3, R^4 and R^5 represents a hydrogen atom, a straight or branched alkyl radical of 1 to 6 carbon atoms, a cyclopentyl or cyclohexyl radical or a phenyl, phenylalkyl or alkylphenyl radical where the alkyl radical contains 1 to 6 carbon atoms, at least two of R^1, R^2, R^3, R^4 and R^5 representing hydrogen or wherein two of the radicals R^1, R^2, R^3, R^4 or R^5, attached to adjacent carbon atoms of the benzene ring together with the two carbon atoms of the benzene ring to which they are attached form a second benzene ring which is ortho-condensed with the first benzene ring, by hydrogenating an aromatic nitro derivative of the formula:



in which R^1, R^2, R^3, R^4 and R^5 are as defined above in the presence of a platinum catalyst, the improvement which consists of effecting the hydrogenation in the presence of a nitrogen-containing organic base selected from the group consisting of secondary and tertiary alkylmonoamines containing 1 to 6 carbon atoms in each alkyl group, cyclopentylamine and cyclohexylamine, pyrrolidine and piperidine, and pyrrolidines and piperidines substituted by 1 or 2 alkyl groups each containing up to 4 carbon atoms, bonded to a ring atom; N-alkyl and N-cycloalkyl anilines where the N-alkyl group contains 1 to 4 carbon atoms, the N-cycloalkyl group is cyclopentyl or cyclohexyl and the aniline ring is unsubstituted or substituted by an alkyl group of 1 to 4 carbon atoms, pyridine, alkyl and dialkyl pyridines where the alkyl group contains 1 to 4 carbon atoms, quinoline and isoquinoline, the ratio by weight of the organic base to the nitro compound being from 0.5:1 to 5:1.

3,927,102
SEPARATION AND RECOVERY OF SECONDARY ALKYL PRIMARY AMINES

Jackson K. S. Chiou, Fishkill, and Ronald E. Jones, Glenham, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,372

Int. Cl.² C07C *76/06, 85/26*

U.S. Cl. 260—583 N **21 Claims**

1. A process for the separation and recovery of a secondary alkyl primary amine having from 14 to 30 carbon atoms from a crude hydrogenated nitroparaffin composition containing said amine and a C_{14} to C_{30} alcohol, ketone and paraffin hydrocarbon which comprises:

a. treating said crude composition with an acid, water and a low molecular weight alcohol thereby forming an aqueous and a hydrocarbon layer the parts by weight of water and alcohol per part by weight of amine in the crude composition in (a) being from about 1.5 to 25 and the weight ratio of water to alcohol in (a) ranges from about 1:0.4 to 1:20;

b. separating said aqueous layer of (a) and removing low molecular weight alcohol from said aqueous layer;

c. treating said aqueous layer of (b) with a base; and

d. separating said secondary alkyl primary amine from said treated aqueous layer of (c).

3,927,103
DIFLUOROAMINO COMPOUNDS

Robert J. Koshar, Lincoln Township, Washington County; Donald R. Husted, St. Paul; Charles D. Wright, White Bear Lake, and Joseph La Mar Zollinger, Woodbury Township, Washington County, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 425,113, Jan. 8, 1965, Pat. No. 3,758,555. This application May 4, 1972, Ser. No. 250,196

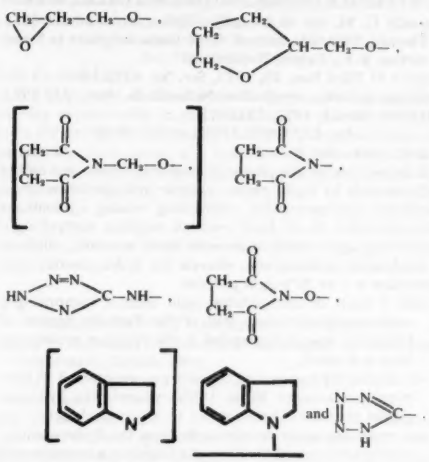
Int. Cl. C07c *87/22, 101/00*

U.S. Cl. 260—584 C **4 Claims**

1. A compound having the formula

$$R-C(NF_2)_3$$

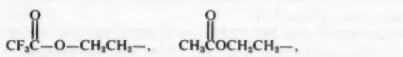
wherein R is a radical of the group consisting of



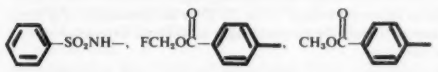
2. A compound having the formula

$$Z-O-C(NF_2)_3$$

wherein Z is a radical of the group consisting of alkyl having from 1 to 12 carbon atoms, cyclohexyl, fluoromethyl, 2,2,2-trifluoroethyl, difluoromethyl, allyl, 2-propynyl,



2,3-di(difluoramino)-propyl, ethoxy, butoxy, acrylyl, acetyl, butyryl, benzyl, benzoyl,



and p-nitrophenyl.

4. The compound 1,2,3-tris(tris-difluoramino-methoxy)-propane.

3,927,104

POLYBUTENYL-ALKYLENE POLYAMINE-POLYALKANOL LUBRICANT ADDITIVE

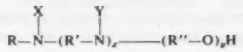
Edward F. Miller, Wappingers Falls, and Walter W. Hellmuth, Hopewell Junction, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 408,226, Oct. 19, 1973, which is a continuation-in-part of Ser. No. 155,286, June 21, 1971, abandoned. This application Dec. 18, 1974, Ser. No. 533,910

Int. Cl.² C07C *87/20*

U.S. Cl. 260—584 B **8 Claims**

1. An oil-soluble, ashless polybutenyl-alkylene polyamine-polyalkanol dispersant represented by the formula:



in which R is a polybutenyl radical having a molecular weight ranging from 900 to 10,000, X and Y are H or $(R''—O)_yH$ at least one of X or Y being $(R''O)_yH$, R′ is a divalent hydrocarbyl radical having from 2 to 8 carbon atoms, R″ is a divalent hydrocarbyl radical having from 2 to 4 carbon atoms, x has a value from 1 to 6, and y has a value from 1 to 5.

3,927,105

PROCESS FOR THE PREPARATION OF MIXTURES OF CYCLOALKANOLS AND CYCLOALKANONES

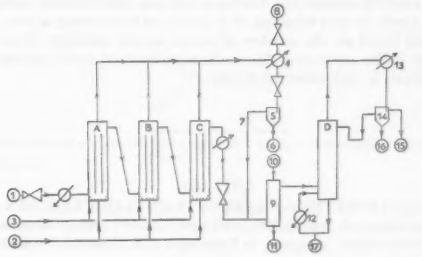
Jean-Claude Brunie, and Noel Crenne, both of Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

Continuation of Ser. No. 814,082, April 7, 1969, abandoned. This application Feb. 16, 1973, Ser. No. 333,374

Claims priority, application France, Apr. 8, 1968, 68.147364

Int. Cl.² C07C *27/04, 29/00, 45/00*

U.S. Cl. 260—586 P **6 Claims**



1. In a process for the continuous preparation of a mixture of cycloalkanone and cycloalkanol by decomposition of a solution of cycloalkyl hydroperoxide in the corresponding cycloalkane, said solution being obtained by oxidation of the cycloalkane in the liquid phase with molecular oxygen, said decomposition being carried out in the liquid phase by heating the solution in the presence of a catalyst which is a chromium compound soluble in the cycloalkane at ambient temperature, the improvement comprising decomposing said hydroperoxide by heating said solution containing 2–15 percent by weight hydroperoxide at 80° – 150° C. in the presence of a chromium compound having a solubility of at least 0.1 g/liter in the cycloalkane at ambient temperature, the heating carried out in a series of separate reaction zones, in each of which the hydroperoxide concentration is maintained at an essentially uniform value throughout the zone, and from each of which the water formed during the deperoxidization is separated, thereby producing a mixture of cycloalkanol and cycloalkanone rich in cycloalkanone.

3,927,106

PREPARATION OF TETRACHLOROCYCLO-HEXANONE

Eugene C. Gilbert, Hanover Park; Robert E. Jones, Arlington Heights; Donald C. McLean, Barrington, all of Ill., and Edward Sherman, Genoa City, Wis., assignors to The Quaker Oats Company, Chicago, Ill.

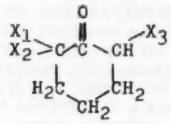
Continuation-in-part of Ser. No. 115,771, Feb. 16, 1971, abandoned. This application Mar. 4, 1974, Ser. No. 447,910

Int. Cl.² C07C *45/00*

U.S. Cl. 260—586 R **13 Claims**

1. A process for the preparation of 2,2,6,6-tetrachlorocyclohexanone comprising contacting under substantially anhydrous conditions and in the liquid phase a mixture of chlorine and a substrate in the presence of a catalyst selected from the group consisting of collidines, pyridine, quinoline, lutidines,

picolines, pyrazine, N,N-dimethylacetamide, N,N-diethylacetamide, N,N-dimethylpropionamide, N,N-diethylpropionamide, tetramethylurea, tetraethylurea, dimethyldiethylurea, monomethyltriethylurea, trimethylethylurea, tri-n-butylamine, trimethylamine, tripropylamine, and the hydrochloric acid and acetic acid salts of the aforementioned amines at a temperature between 60°C. or the temperature at which the reaction mixture is a liquid, whichever is higher, and 120°C.; said substrate being of the general formula:



wherein X_1, X_2, and X_3 are selected from the group consisting of chlorine radicals and hydrogen radicals; said chlorine being in a ratio to said substrate of in excess of three molar equivalents based on the number of moles of said substrate minus one molar equivalent for each equivalent of said chlorine radicals in said substrate to one.

3,927,107

2,6,6-TRIMETHYL-1-ALKENOYL-CYCLOHEXENONES

Karl-Heinrich Schulte-Elte, and Henri Jindra, both of Geneva, Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

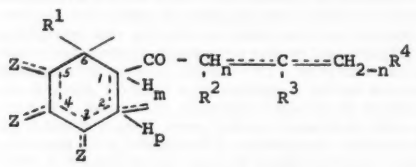
Filed Oct. 23, 1973, Ser. No. 408,919

Claims priority, application Switzerland, Oct. 26, 1972, 15691/72; Mar. 21, 1973, 4096/73

Int. Cl.² C07C *49/44*

U.S. Cl. 260—586 R **4 Claims**

1. Oxygenated alicyclic compounds of the formula



wherein the symbols R^1, R^2, R^3 and R^4 represent alkyl radicals containing from 1 to 6 carbon atoms or hydrogen atoms, provided that the total number of hydrogen atoms represented by the symbols R^2, R^3 and R^4 equals at least two; and containing a first double bond in one of the dotted line positions of the keto side chain and a second double bond in one of the endocyclic or the number two exocyclic dotted line positions of the ring; the indexes *m* and *p* represent the integers zero or one when the hydrogen atoms for which they are multipliers are connected to a double bonded or single bonded cyclic carbon respectively; one of the symbols Z represents an oxygen atom when connected to an otherwise single bonded carbon and the other Z symbols represent one or two hydrogen atoms when connected to a double bonded or single bonded carbon respectively; and the index n represents the integers zero or one when the hydrogen for which it is a multiplier is connected to a double bonded or single bonded carbon atom, respectively.

3,927,108

PROCESS FOR THE PREPARATION OF CYCLOALKANONES AND/OR CYCLOALKANOLS

Cornelis G. M. van de Moesdijk, Elsloo, and Andreas M. J. Thomas, Kerkrade, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Nov. 20, 1973, Ser. No. 417,635

Claims priority, application Netherlands, Nov. 23, 1972, 7215854; Nov. 3, 1973, 7315102

Int. Cl.² C07C *27/04, 45/00, 29/00*

U.S. Cl. 260—586 P **14 Claims**

1. A process for the preparation of cycloalkanones and/or cycloalkanols by liquid phase catalytic hydrogenation of cycloalkane hydroperoxides, comprising mixing cycloalkane hydroperoxides in an inert reaction medium comprising a distributing agent which is an inert liquid aromatic, aliphatic or naphthenic hydrocarbon, wherein the hydroperoxide concentration is 1 to 30 weight percent,

with a finely divided catalyst, said catalyst comprising a noble metal of Group VIII of the Periodic System of Elements, that is suspended in the reaction medium to form a mixture;

introducing hydrogen into the mixture maintained at temperatures between 20° to 180°C, wherein the hydrogen partial pressure is between 0.1 to 50 atmospheres;

and removing water continuously from the hydrogenation reaction mixture in the form of a vaporous azeotrope with the distributing agent.

3,927,109

PROCESSES FOR THE PREPARATION OF CYCLIC ALDEHYDES

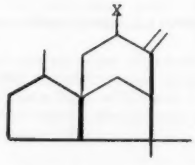
Wilhelmus J. Wiegers, Middletown, and John B. Hall, Rumson, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 260,537, June 7, 1972, Pat. No. 3,869,516. This application Aug. 26, 1974, Ser. No. 500,280

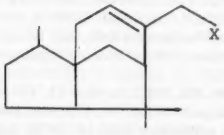
Int. Cl.² C07C *47/44*

U.S. Cl. 260—598 **8 Claims**

1. A process for the production of cyclic carbonyl compounds which comprises reacting alpha-cedrene with a halogen at temperatures of 0° to 75°C in the presence of a basic material to provide an alpha-halo methylene derivative having the structure



isomerizing the alpha-halo methylene derivative by heating to a temperature of from 75° to 175°C to form a halo derivative having the structure



and oxidizing the halo derivative with an alkali metal salt of 2-nitropropane to obtain cedrenal, wherein X is chloro, bromo, or iodo.

3,927,110
THERMOLYSIS OF STYRENE OXIDE

James M. Watson, Big Spring, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.

Filed Jan. 18, 1974, Ser. No. 434,675
Int. Cl.² C07C *45/22*
U.S. Cl. 260—599 19 Claims

1. The process of thermolysis of styrene oxide comprising heating styrene oxide in the presence of a member selected from the group consisting of aryl and alkyl aryl sulfonates of an alkaline earth metal at a temperature of between about 125°C and 450°C to obtain a reaction product comprising phenylacetaldehyde.

3,927,111
PRODUCTION OF CARBONYL COMPOUNDS

James V. Robinson, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Dec. 8, 1971, Ser. No. 206,127
Int. Cl.² C07C *45/04*, *27/16*, *51/32*, *67/00*
U.S. Cl. 260—604 AC 7 Claims

1. In a Wacker-type process for the production of a carbonyl compound from olefinically unsaturated hydrocarbon gas in which said hydrocarbon gas is oxidized in the presence of an aqueous catalyst, the improvement comprising:

a. introducing said aqueous catalyst into a reaction chamber containing a bed of wetproofed solid particulate material selected from the group consisting of wetproofed carbon particles and wetproofed activated carbon particles,

b. introducing said hydrocarbon gas and a gaseous oxidant into said reaction chamber and into contact with said wetproofed solid material and said catalyst to form a reaction mixture of said hydrocarbon gas, catalyst and oxidant,

c. maintaining said reaction chamber at a sufficiently low temperature and pressure to prevent formation of vapor phase conditions,

d. maintaining at least a portion of said catalyst and at least a portion of said hydrocarbon gas and oxidant in said reaction mixture simultaneously in contact with each other and simultaneously in contact with said wetproofed solid material to effect production of said carbonyl compound, and

e. separating said carbonyl compound from said reaction mixture.

3,927,112
PROCESS FOR THE PREPARATION OF BIS-HYDROXYMETHYL-METHYLPHOSPHINE

Martin Reuter, Kronberg, Taunus, and Claus Beermann, Wildsachsen, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 11, 1974, Ser. No. 460,151
Claims priority, application Germany, Apr. 14, 1973, 2319043
Int. Cl.² C07D *105/02*
U.S. Cl. 260—606.5 P 9 Claims

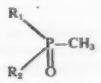
1. A process for the preparation of bis-(hydroxymethyl)-methyl phosphine oxide which comprises contacting tris-(hydroxymethyl)-phosphine with at least about 1% by weight of carbon tetrachloride or carbon tetrabromide at a temperature between about −10° and about 120°C. substantially in the absence of oxygen, water and alcohol, and after reaction distilling off the carbon tetrahalide to isolate said bis-(hydroxymethyl)-methyl phosphine oxide, the percent being based on the weight of said tris-(hydroxymethyl)-phosphine.

3,927,113
PROCESS FOR THE PREPARATION OF METHYLPHOSPHINE OXIDES

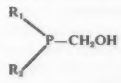
Martin Reuter, Kronberg, Taunus, and Walter Rupp, Konigstein, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 11, 1974, Ser. No. 460,153
Claims priority, application Germany, Nov. 16, 1973, 2357276
Int. Cl.² C07D *105/02*
U.S. Cl. 260—606.5 P 14 Claims

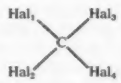
1. A process for the preparation of methyl phosphine oxide of the formula



wherein R_1 and R_2 each is alkyl having up to 20 carbon atoms, alkyl having up to 20 carbon atoms and substituted by a group inert under the conditions of the process, or $-CH_2OH$, which comprises contacting a hydroxymethyl-phosphine of the formula



with at least about 1% by weight of a carbon tetrahalide of the formula



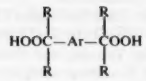
wherein Hal_1 is fluorine, chlorine or bromine, Hal_2, Hal_3 and Hal_4 each is chlorine or bromine and only three of Hal_1 to Hal_4 are the same, at a temperature between about −10° and about 120°C. substantially in the absence of oxygen, water and alcohol, and after reaction distilling off said carbon tetrahalide to isolate said methyl phosphine oxide, the percent being based on the weight of said hydroxymethyl-phosphine.

3,927,114
PROCESS FOR SEPARATING HYDROPEROXIDES

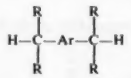
Hideaki Suda, Takaishi; Iwao Dohgane, Nishinomiya; Takashi Chinuki, Toyonaka; Kenji Tanimoto; Hirokazu Hosaka, both of Minoo; Yukimichi Nakao, Kobe; Yuji Ueda, Izumiotsu; Seiya Imada, Sakai; Hideki Yanagihara, Toyonaka, and Kunihiko Tanaka, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed July 9, 1973, Ser. No. 377,656
Claims priority, application Japan, July 19, 1972, 47-72852
Int. Cl.² C07C *179/02*
U.S. Cl. 260—610 A 7 Claims

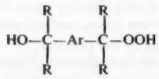
1. A process for separating dihydroperoxides of the formula,



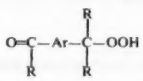
wherein R is a C_1–C_2 alkyl group and Ar is an aromatic phenylene group, from oxidation product of dialkylaromatic hydrocarbons of the formula,



wherein R and Ar have the same meanings as above, the oxidation product containing monohydroperoxides, dihydroperoxides, carbinol type hydroperoxides of the formula,



wherein R and Ar are as defined above, and ketone type hydroperoxides of the formula,



wherein R and Ar are as defined above, which comprises contacting the oxidation product with a basic ion exchange resin in microporous or gel state to adsorb the dihydroperoxides on the ion exchange resin, and eluting the dihydroperoxides adsorbed on the ion exchanger with an eluting agent said eluting agent is one member selected from aqueous alkaline solutions, ketones having 3 to 10 carbon atoms, alcohols having 1 to 8 carbon atoms and ethers having 2 to 5 carbon atoms.

3,927,115

PRODUCTION OF HYDROPEROXIDES

Edward G. Guetens, Glendora, N.J., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 124,973, March 16, 1971, Pat. No. 3,741,907. This application Dec. 26, 1973, Ser. No. 427,596

Int. Cl.² C07C *179/02, 31/13, 45/16*

U.S. Cl. 260—610 B **10 Claims**

1. A method for preparing cyclohexyl hydroperoxide comprising contacting cyclohexane in the liquid phase with molecular oxygen at a temperature in the range of from 80°C. to 180°C. in the presence of a branched chain alkane hydrocarbon having a tertiary carbon atom and containing from 4 to 6 carbon atoms.

3,927,116

BICYCLO[2.2.1] HEPT-5(6)-YL COMPOUNDS

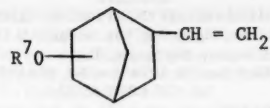
Edward A. Rick, Charleston, W. Va., and Samuel W. Tinsley, Darien, Conn., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 677,741, Oct. 24, 1967, Pat. No. 3,646,113, which is a continuation-in-part of Ser. No. 404,477, Oct. 16, 1964, Pat. No. 3,459,775. This application May 27, 1971, Ser. No. 147,650

Int. Cl.² C07C *35/28, 43/18*

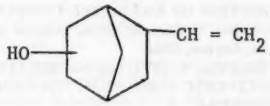
U.S. Cl. 260—611 F **3 Claims**

1. Ethers of 2-vinylbicyclo[2.2.1]hept-5(6)-ol of the formula:



R^7 is selected from the group consisting of alkyl of from 1 to 18 carbon atoms, alkenyl of from 2 to 20 carbon atoms, cycloalkyl of from 5 to 12 carbon atoms and cycloalkenyl of from 5 to 12 carbon atoms.

2. 2-Vinylbicyclo[2.2.1]hept-5(6)-hydroxyl compounds of the formula:



3,927,117

SUBSTITUTED STYRENES

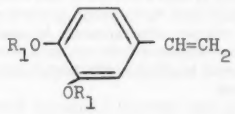
Thomas A. Bianchi, Irondequoit, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 237,902, March 24, 1972, abandoned. This application Aug. 24, 1973, Ser. No. 391,180

Int. Cl.² C07C *41/00*

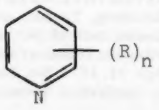
U.S. Cl. 260—613 D **10 Claims**

1. A method for making a substituted styrene represented by the formula:



wherein each R_1 is an alkyl radical of 1 to 4 carbon atoms, comprising:

mixing (i) a halogenating agent selected from thionyl chloride, hydrogen bromide, thionyl bromide, phosphorous tribromide and iodine, (ii) an amine acceptor of the generic formula:



wherein R is an alkyl group of 1 to 6 carbon atoms, n is an integer having a value of from 1 to 5, and at least one alkyl group is attached to a carbon atom adjacent to the nitrogen atom and when n is more than 1, the alkyl groups may be the same or different groups, and (iii) a 1-(3,4-dialkoxyphenyl)ethanol wherein each alkoxy moiety has 1 to 4 carbon atoms, and

heating the resulting mixture for a sufficient period of time and at a temperature sufficient to obtain said substituted styrene.

3,927,118
PROCESS FOR MONOETHERIFICATION OF POLYHYDRIC BENZENES

Thomas M. Ozretich, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Dec. 21, 1973, Ser. No. 427,200
Int. Cl.² C07C *43/22*
U.S. Cl. 260—613 D 16 Claims

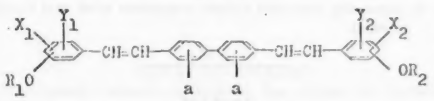
1. In a process for converting an aromatic compound having at least two hydroxyl groups on a benzene ring to the corresponding monoether by reacting the compound with an alkylating agent in the presence of a base in a reaction medium, the improvement wherein the reaction is carried out in a single phase in which the reaction medium comprises a dipolar aprotic solvent having a sulfoxide, sulfone or amide group, and the base is an alkaline earth hydroxide or alkaline earth oxide.

3,927,119
BIS-STILBENE COMPOUNDS

Christian Luethi, Muenchenstein, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 230,931, March 1, 1972, Pat. No. 3,843,718. This application May 22, 1974, Ser. No. 472,391
Claims priority, application Switzerland, Mar. 5, 1971, 3235/71; Feb. 3, 1972, 1608/72
Int. Cl.² C07C *43/20*
U.S. Cl. 260—613 A 1 Claim

1. Bis-stilbene compounds of the formula



wherein R_1 and R_2 are identical or different and denote alkyl with 5 to 18 carbon atoms, substituted alkyl with a total of 2 to 20 carbon atoms of which the substituents are phenyl or phenyl substituted by lower alkyl or halogen, or alkenyl with 3 to 4 carbon atoms, X_1 and X_2 are identical or different and denote hydrogen, alkoxy with 1 to 4 carbon atoms, halogen, alkenyl with 3 to 4 carbon atoms or alkyl with 1 to 4 carbon atoms, Y_1 and Y_2 are identical or different and denote hydrogen, halogen, alkenyl with 3 to 4 carbon atoms or alkyl with 1 to 4 carbon atoms, a represents hydrogen, halogen, alkoxy with 1 to 4 carbon atoms or alkyl with 1 to 4 carbon atoms, and the parapositions are free of alkoxy groups or R_1O— and R_2O— groups.

3,927,120
PREPARATION OF PHENYL METHYL CARBINOL

Henry R. Grane, and Thomas S. Zak, both of Springfield, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sept. 3, 1974, Ser. No. 502,583
Int. Cl.² C07C *29/00*
U.S. Cl. 260—618 H 3 Claims

1. In a method in which a liquid stream of acetophenone and a molar excess of hydrogen is subjected to a solid bed of particles of catalyst comprising copper distributed in a zinc oxide matrix as a hydrogenation catalyst at an elevated pressure and temperature within a range from about 90° to 150°C., at a space velocity of about 0.2 to about 10 weight of acetophenone per weight of catalyst per hour, the improvement which consists of employing a catalyst in which the copper to zinc atom unit ratio in the catalyst particles is within the range from 2 to 8, and preparing the liquid stream to be a solution containing between about 20 percent and about 80 percent of a mononuclear aromatic hydrocarbon selected from the group consisting of benzene, ethyl benzene and toluene, and between about 80 percent and 20 percent feedstock consisting essentially of a plant grade of acetophenone and directing said solution of acetophenone feedstock in mononuclear aromatic hydrocarbon solvent through the catalyst bed at hydrogenation conditions to achieve a better combination of yield, conversion and selectivity for phenyl methyl carbinol than in the absence of said mononuclear aromatic hydrocarbon solvent.

3,927,121
PHENYL METHYL CARBINOL MANUFACTURE BY HYDROGENATION OF ACETOPHENONE

Henry R. Grane, and Thomas S. Zak, both of Springfield, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 5, 1974, Ser. No. 494,573
Int. Cl.² C07C *29/00*
U.S. Cl. 260—618 H 2 Claims

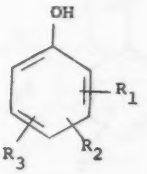
1. In the method in which acetophenone is hydrogenated by reaction with hydrogen in the presence of a catalyst to form phenyl methyl carbinol, the improvement which consists of utilizing as the catalyst for the catalytic hydrogenation granular catalyst particles consisting essentially of copper metal in a zinc oxide matrix, the ratio of zinc atoms to copper atoms being 2:1, said hydrogenation being conducted by directing a stream of liquid acetophenone and hydrogen through a fixed bed of said granular catalyst particle at a temperature within the range from 113° to 138°C. at a pressure of 1200 psig at a hydrogen to acetophenone mol ratio of from 1:1 to 30:1 and a weight hourly space velocity within a range from 1 to 2 weight of acetophenone per weight of catalyst per hour.

3,927,122
PROCESS FOR THE PREPARATION OF ALKYLPHENOLS

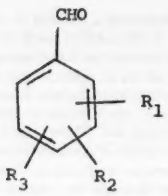
Francois Bourdin, Lyon; Francois Chizat, Bron; Michel Costantini, Lyon, and Michel Jouffret, Francheville Le Bas, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Dec. 20, 1971, Ser. No. 210,207
Claims priority, application France, Dec. 22, 1970, 70.46219
Int. Cl.² C07C *27/00, 37/00, 67/44*
U.S. Cl. 260—621 G 13 Claims

1. In a process for the preparation of an alkylphenol of general formula



wherein R_1 to R_3 are selected from the group consisting of hydrogen and straight-chain or branched chain alkyl of 1 to 10 carbons with the proviso that not more than two of the symbols R_1, R_2 and R_3 represent hydrogen, by oxidizing an alkyl benzaldehyde of general formula



wherein R_1 to R_3 are as defined above, by means of an organic peracid, the improvement which comprises using an organic percarboxylic acid, the parent carboxylic acid of which has a pK_a in water of at least 4, in the presence of a carboxylic acid of pK_a in water less than 4 whereby an oxidation product is obtained containing more alkylphenol than alkylbenzoic acid.

3,927,123

PROCESS FOR THE PREPARATION OF ALKYLPHENOLS

Francois Bourdin, Lyon; Francois Chizat, Bron; Michel Costantini, Lyon, and Michel Jouffret, Francheville Le Bas, all of France, assignors to Rhone-Poulenc S.A., Paris, France

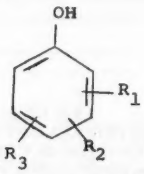
Filed Dec. 20, 1971, Ser. No. 210,208

Claims priority, application France, Dec. 22, 1970, 70.46218The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.

Int. Cl.[2] C07C *27/00, 37/00, 67/44*

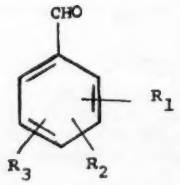
U.S. Cl. 260—621 G **12 Claims**

1. In a process for the preparation of an alkylphenol of general formula



I

in which R_1 to R_3 are selected from the group consisting of hydrogen and straight-chain or branched chain alkyl of 1 to 10 carbons with the proviso that not more than 2 of R_1, R_2 and R_3 represent hydrogen, by oxidizing an alkyl benzaldehyde of general formula



II

wherein R_1 to R_3 are defined above, by means of an organic peracid, the improvement which comprises using an organic peracid, the parent carboxylic acid of which has a pK_a in water of less than 4, whereby an oxidation product is obtained containing more alkylphenol than alkylbenzoic acid.

3,927,124

PROCESS FOR THE NEUTRALIZATION OF ALKYL AROMATIC HYDROPEROXIDE REARRANGEMENT REACTION PRODUCTS

Ward J. Burkholder, Houston, Tex., assignor to The Goodyear Tire and Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 16,853, March 5, 1970, abandoned. This application Jan. 3, 1973, Ser. No. 320,807

Int. Cl.[2] C07C *37/08, 37/42, 37/22*

U.S. Cl. 260—621 A **17 Claims**

1. In a process for the production of a hydroxy aromatic compound wherein an alkyl aromatic hydroperoxide is rearranged in a substantially non-aqueous solvent using a sulfuric acid catalyst to produce a rearrangement product mixture containing said hydroxy aromatic compound, the improvement comprising:

a. introducing into the rearrangement product mixture an amount of a basic anhydrous gas selected from the class consisting of ammonia, methyl amine, and triethyl amine in excess of that necessary to convert said sulfuric acid to a solid, substantially insoluble bisulfate compound but less than that necessary to convert all of said sulfuric acid to the corresponding sulfate,

b. separating said bisulfate compound from said rearrangement product mixture and recovering a liquid product substantially free of said solid bisulfate compound,

c. introducing into said liquid product an amount of a basic anhydrous gas selected from the class consisting of ammonia, methyl amine, and triethyl amine at least sufficient to convert any dissolved bisulfate compound to a substantially insoluble sulfate and to maintain a hydrogenion concentration in said rearrangement product mixture corresponding to an aqueous solution consisting of the neutralized product mixture diluted with an equal volume of water having a pH of from 3 to 6, and

d. separating any solid sulfate compound from said liquid product.

3,927,125

METHOD OF PREPARING 2,4,6-TRIIODORESORCINOL

Alexei Nikolaevich Grinev, ulitsa Volgina, 15, korpus 2, kv. 57; Vasily Ivanovich Shvedov, ulitsa M. Ulyanovoi, 9, korpus 3, kv. 11; Evgenia Nikolaevna Sytina, 5 Parkovaya ulitsa, 4, korpus 2, kv. 93; Nadezhda Sergeevna Bogdanova, ulitsa 26 Bakinskikh komissarov, 1, korpus 1, kv. 26; Irina Sergeevna Nikolaeva, Matveevskaya ulitsa, 1, kv. 179; Grigory Nikolaevich Pershin, Novopeschanaya ulitsa, 19/10, kv. 75, and Tatyana Anatolievna Guskova, ulitsa Usievicha, 25, korpus 3, kv. 396, all of Moscow, U.S.S.R.

Filed June 3, 1974, Ser. No. 476,043

Int. Cl.[2] C07C *39/27*

U.S. Cl. 260—623 H **4 Claims**

1. Method of producing 2,4,6-triiodoresorcinol, which comprises reacting resorcinol with iodine chloride in a medium consisting essentially of dilute aqueous hydrochloric acid at a temperature of 0 to 60°C., whereby the resorcinol is directly iodinated to 2,4,6-triiodoresorcinol.

3,927,126

PROCESS FOR THE MANUFACTURE OF POLYFLUOROALCOHOLS AND THEIR USE

Helmut Huber-Emden, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

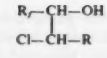
Filed Feb. 16, 1973, Ser. No. 333,246

Claims priority, application Switzerland, Feb. 22, 1972, 2552/72

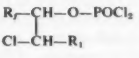
Int. Cl.[2] C07C *31/34*

U.S. Cl. 260—633 **7 Claims**

1. A process for the manufacture of polyfluoroalcohols of the formula



in which R_f represents perfluorinated alkyl of 1 to 22 carbon atoms and R represents hydrogen, methyl or hydroxymethyl, wherein phosphorus-containing polyfluoro compounds of the formula



in which R_f has the meaning given hereinabove and R_1 represents hydrogen, methyl or the radical of the formula

$$-CH_2-O-POCl_2$$

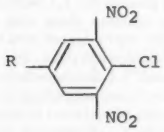
are hydrolysed in a high boiling water donating compound selected from the group consisting of ethylene glycol, dihydroxy propane-1,2 and glycerol at temperatures of 100° to 180°C.

3,927,127
NITRATION PROCESS

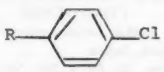
John Joseph Damiano, Springfield, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Continuation-in-part of Ser. No. 300,063, Oct. 24, 1972, abandoned. This application Aug. 15, 1974, Ser. No. 497,802
Int. Cl.[3] C07C *79/12*
U.S. Cl. 260—646 **10 Claims**

1. A process for preparing 4-R-2,6-dinitrochlorobenzene compounds of the formula:



wherein R is selected from the group consisting of branched chain hydrocarbons containing from 3 to 7 carbon atoms, comprising the step of treating a compound of the formula:



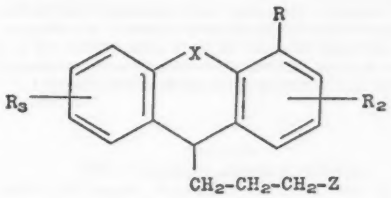
with a mixture of concentrated sulfuric acid of at least 98% concentration by weight and concentrated nitric acid of greater than 70 percent concentration by weight at a temperature of from about 15°C to about 115°C for at least 1 hour, whereby the reaction is carried to substantial completion.

3,927,128
TRICYCLIC AMINES AND PROCESSES FOR THE PREPARATION THEREOF

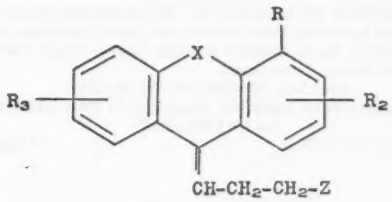
Emilio Kyburz, Reinach, and Hans Spiegelberg, Basel, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 107,499, Jan. 18, 1971, abandoned, Continuation of Ser. No. 679,644, Nov. 1, 1967, abandoned. This application Mar. 8, 1974, Ser. No. 449,303
Int. Cl.[2] C07C *25/18, 25/26*
U.S. Cl. 260—649 R **6 Claims**

1. A compound selected from the group consisting of compounds of the formulas

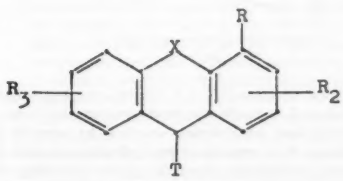


and



wherein R is chlorine or fluorine, R_2 and R_3 are hydrogen, chlorine or fluorine, X is ethylene, vinylene or halosubstituted vinylene, and Z is halogen.

6. A compound of the formula



X

wherein R is chlorine or fluorine, R_2 and R_3 are hydrogen, chlorine or fluorine, X is ethylene, vinylene or a halo-substituted vinylene and T is an alkalimetal atom.

3,927,129

PROCESS FOR INSERTION OF HEXAFLUOROPROPENE AT THE ALIPHATIC CARBON-HYDROGEN BOND OF A FUNCTIONALLY SUBSTITUTED HYDROCARBON

Robert Neville Haszeldine, Disley, and Ronald Rowland, Padgate, both of England, assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 5, 1973, Ser. No. 321,162

Claims priority, application United Kingdom, Jan. 14, 1972, 1989/72

Int. Cl.² C07C *17/26, 19/08*

U.S. Cl. 260—653.1 R **3 Claims**

1. A process for inserting hexafluoropropene into the structure of a substituted hydrocarbon compound free of acetylenic and terminal ethylenic unsaturation, and containing at least one aliphatic carbon-hydrogen bond and at least one functional moiety inert under the conditions of reaction selected from the class consisting of halogens, said insertion of hexafluoropropene being at said carbon-hydrogen bond, which comprises contacting said substituted hydrocarbon compound with hexafluoropropene monomer at a temperature in the range of about 160°C to about 350°C, and at a pressure of about 1 to about 250 atmospheres, in the absence of free oxygen-containing gases and free-radical catalyst.

3,927,130

METHOD OF ISOMERIZING DICHLOROBUTENES

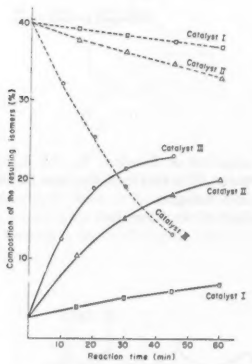
Takashi Kadowaki; Takao Iwasaki, and Hideki Matsumura, all of Ohmi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 30, 1969, Ser. No. 862,217

Claims priority, application Japan, Oct. 9, 1968, 43-73359

Int. Cl. C07c *21/00*

U.S. Cl. 260—654 R **3 Claims**



1. In a method of isomerizing 3,4-dichlorobutene-1 and 1,4-dichlorobutene-2 mutually, the improvement which comprises conducting said isomerization reaction by using as a catalyst, a mixture of an organic amine hydrochloride and at least one substance selected from the group consisting of copper, cuprous chloride, anhydrous cupric chloride, anhydrous cupric sulfate, cupric acetate, basic copper carbonate, anhydrous ferric chloride, anhydrous aluminum chloride, titanium chloride, zinc chloride, anhydrous tin chloride, and bismuth chloride under substantially anhydrous conditions at a temperature of from 60° to 120°C, wherein said organic amine hydrochloride is at least one of the hydrochlorides of an amine selected from the group consisting of diethylamine, triethylamine, triethanolamine, ethylenediamine, monomethylamine, dimethylamine, trimethylamine, di-n-propylamine, tributylamine, aniline, α -naphthylamine, β -naphthylamine, diphenylamine, p-phenylenediamine, m-phenylenediamine, N,N-dimethylaniline, and benzidine, wherein said one substance is used in an amount of from 0.01 to 10.0% by weight, based on the weight of said dichlorobutenes to be isomerized and wherein said organic amine hydrochloride is used in an amount of from 0.01 to 5% by weight based on the weight of the dichlorobutenes to be isomerized.

3,927,131

DEHYDROHALOGENATION OF HALOGENATED HYDROCARBONS

Joe Arthur Ward, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 10, 1974, Ser. No. 477,577

Int. Cl.² C07C *21/00*

U.S. Cl. 260—654 D **9 Claims**

1. In the method for thermally dehydrochlorinating a chlorinated aliphatic hydrocarbon containing from two to about 12 carbon atoms and from two to six chlorine atoms by contacting the chlorinated aliphatic hydrocarbon in the vapor phase with a catalyst at an elevated temperature to produce an unsaturated chlorinated hydrocarbon containing the same number of carbon atoms as said reactant chlorinated hydrocarbon, the improvement which comprises employing as the catalyst a material consisting essentially of a rare earth oxide in combination with a platinum group metal on a support.

3,927,132

PROCESS FOR PRODUCING 1,1,1-TRICHLOROETHANE

Gordon G. Willis; John B. Ivy; Theodore S. Boozalis, and Darryl E. Cragar, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 22, 1974, Ser. No. 462,702

Int. Cl.² C07C *17/10*

U.S. Cl. 260—658 R **1 Claim**

1. In a method for chlorinating ethyl chloride and 1,1-dichloroethane to produce 1,1,1-trichloroethane, 1,1-dichloroethane, vinylidene chloride and numerous by-products and in which process the 1,1-dichloroethane is recycled to the chlorination reaction along with cis- and trans- 1,2-dichloroethylene the improvement which comprises separating the trans-1,2-dichloroethylene away from the cis-1,2-dichloroethylene and 1,1-dichloroethane, the recycled cis-1,2-dichloroethylene being isomerized to an isomeric mixture of about 60% cis- and 40% trans-1,2-dichloroethylene during the chlorination of the 1,1-dichloroethane and ethyl chloride.

3,927,133

PROCESS FOR SYNTHESIZING STYRENE TYPE COMPOUNDS

Masato Satomura, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Ashigara, Japan

Filed Dec. 26, 1973, Ser. No. 427,867

Claims priority, application Japan, Dec. 26, 1972, 48-2839

Int. Cl.² C07C *15/10, 1/20*

U.S. Cl. 260—669 QZ **30 Claims**

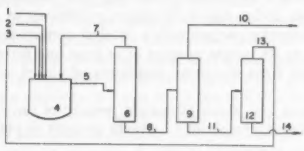
1. A process for synthesizing styrene comprising reacting at least one compound selected from the group consisting of acetophenone, an acetophenone derivative, and a propiophenone derivative having one or more substituents in the aro-

matic nucleus with an aluminum compound having at least one aluminum-oxygen-carbon bond, wherein said acetophenone derivative and said propiophenone derivative has one or more substituents selected from the group consisting of halogen atoms, alkyl groups, aralkyl groups, aryloxy groups, haloalkyl groups, allyl groups, allyloxy groups, alkoxyalkyl groups, alkoxy-alkoxy groups, alkoxy groups, haloalkoxy groups, nitro groups and a dimethyl amino group.

3,927,134
PROCESS FOR PREPARATION OF DIISOPROPYLBENZENE

Tadahisa Yanagihara, and Kentaro Fukahori, both of Shinnanyo, Japan (09181975), assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Filed Apr. 15, 1974, Ser. No. 460,929
Int. Cl.² C07C *3/52*
U.S. Cl. 260—671 P **12 Claims**

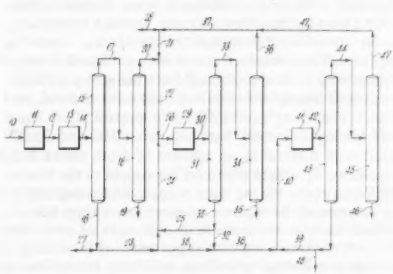


1. A process for the preparation of diisopropylbenzene from crude diisopropylbenzene containing as impurities 2-methyl-2-phenylpentane, 2-phenylhexane and 3-phenylhexane, a by-product formed in the preparation of cumene from benzene and propylene, which comprises reacting said impurities in said crude diisopropylbenzene with propylene in the presence of an alkylation catalyst while isomerizing all o-diisopropylbenzene in said crude diisopropylbenzene to m- and p-diisopropylbenzene; and distilling said diisopropylbenzene from the reaction mixture.

3,927,135
PREPARATION OF HYDROCARBONS

Robert M. Suggitt, Wappingers Falls, and John D. Odle, Poughkeepsie, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed July 5, 1974, Ser. No. 485,859
Int. Cl.² C07C *3/58*
U.S. Cl. 260—672 R **11 Claims**



1. The method of treating a charge monocyclic aromatic hydrocarbon stream containing (i) a monocyclic middle component, (ii) a monocyclic heavier component having a larger number of carbon atoms than does said middle component, and (iii) a lighter component having a smaller number of carbon atoms than does said middle component which comprises:

a. separating said charge monocyclic aromatic hydrocarbon stream into (i) a first stream containing said lighter component, (ii) a second stream containing said middle component, and (iii) a third stream containing said heavier component.

b. dividing said third stream containing said heavier component into (i) first portion containing an amount of said heavier component substantially equivalent to said first stream containing said lighter component and (ii) a second portion containing the remainder of said third stream;

c. transalkylating said first stream containing said lighter component with said first portion of said third stream containing an amount of said heavier component substantially equivalent to said first stream containing said lighter component — thereby forming a transalkylate stream containing said middle component;

d. recovering said middle component from said transalkylate stream;

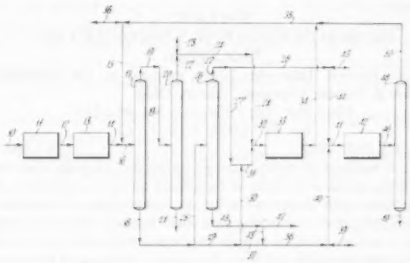
e. dealkylating said second portion of the third stream containing said heavier component thereby forming a dealkylate stream containing a heavier component, a middle component, and a lighter component; and

f. recovering said middle component from said dealkylate stream.

3,927,136
TREATMENT OF HYDROCARBONS

Robert M. Suggitt, Wappingers Falls, and John D. Odle, Poughkeepsie, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed July 5, 1974, Ser. No. 485,857
Int. Cl.² C07C *3/58*
U.S. Cl. 260—672 R **13 Claims**



1. A method of treating a charge monocyclic aromatic hydrocarbon stream containing (i) a middle component, (ii) a heavier component containing more carbon atoms than does said middle component, (iii) a lighter component containing a smaller number of carbon atoms than does said middle component, and (iv) a fused polycyclic hydrocarbon component containing at least as many carbon atoms as does said heavier component which comprises

a. fractionating said charge monocyclic aromatic hydrocarbon stream to form at least (i) a stream containing said lighter component, (ii) a stream containing said middle component, and (iii) a stream containing said heavier component and said fused polycyclic hydrocarbon component;

b. separating fused polycyclic hydrocarbon component from at least a portion of said fractionated stream containing said heavier component and said polycyclic hydrocarbon component thereby forming (i) an enriched stream of said heavier component containing a greater amount of said fused polycyclic hydrocarbon component than said fractionated stream containing said heavier component and said fused polycyclic component and (ii) a denuded stream of said heavier component containing a lesser amount of said fused polycyclic hydrocarbon

component than said fractionated stream containing said heavier component and said fused polycyclic component;

c. combining (i) said fractionated stream containing said lighter component, (ii) at least a portion of said denuded stream, and (iii) less than all of said fractionated stream containing said heavier component and said fused polycyclic hydrocarbon component thereby forming a transalkylation charge stream containing (i) lighter component, (ii) heavier component in amount substantially equivalent to said lighter component, and (iii) fused polycyclic hydrocarbons in amount of less than about 0.3% by weight based upon the content of heavier component in said transalkylation charge stream;

d. transalkylating, at transalkylating conditions in the presence of heterogenous transalkylating catalyst, said transalkylation charge stream thereby forming a transalkylate product stream containing (i) a middle component, (ii) a heavier component containing more carbon atoms than does said middle component, and (iii) a lighter component containing a smaller number of carbon atoms than does said middle component; and

e. withdrawing said transalkylate product stream.

3,927,137
METHOD OF PREPARING NONCONJUGATED DIOLEFINS

Jay G. Bryson, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 18, 1974, Ser. No. 452,242
Int. Cl.² C07C *3/21, 11/12*
U.S. Cl. 260—680 B **8 Claims**

1. A method of codimerizing conjugated diolefin selected from the group consisting of butadiene and 2,3-dimethyl-1,3-butadiene with lower α-olefins to nonconjugated diolefins which comprises contacting said diolefins and lower α-olefins with a ternary catalyst system consisting essentially of (1) an iron compound selected from the group consisting of iron salts of carboxylic acids containing from 2 to 40 carbon atoms and iron complexes of 1,3-diketones, (2) trialkyl aluminums, lithium tetraethyl aluminate and diethyl aluminum ethoxide, and (3) a bidentate nitrogen compound selected from the group consisting of glyoxal-bis-(2,6-dimethylanil), biacetyl-bis-(2,6-dimethylanil), glyoxal-bis-(4-methylanil), biacetyl-bis-(4-methylanil), glyoxal-bis-(2-methylanil), biacetyl-bis-(4-methylanil), glyoxal-bis-(2-methylanil), biacetyl-bis-(2-methylanil), glyoxal-bis-anil, biacetyl-bisanil, glyoxal-bis-(4-ethoxyanil), biacetyl-bis-(4-ethoxyanil), glyoxal-bis-(3-methoxyanil), biacetyl-bis-(3-methoxyanil), glyoxal-bis-(3-methoxyanil), biacetyl-bis-(3-methoxyanil), glyoxal-bis-(4-dimethylaminoanil), biacetyl-bis-(4-dimethylaminoanil), glyoxal-bis-(2,6-dimethyl-4-ethoxyanil), biacetyl-bis-(2,6-dimethyl-4-ethoxyanil), 2-pyridine carboxaldehydeanil, 2-pyridine carboxaldehyde-2-methylanil, 2-pyridinecarboxaldehyde-4-methylanil, 2-pyridinecarboxaldehyde-2-isopropylanil, 2-pyridinecarboxaldehyde-2-ethylanil, 2-pyridinecarboxaldehyde-4-methoxyanil, 2-pyridinecarboxaldehyde-4 -dimethylaminoanil, 2-pyridinecarboxaldehyde-2,6-dimethyl-4-methoxyanil, 2-pyridinecarboxaldehyde-2,6-dimethyl-4-dimethylaminoanil, 2-acetylpyridine-2-methylanil, 2-acetylpyridine-4-methylanil, 2-acetylpyridine-2-isopropylanil, 2-acetylpyridine-4-methoxyanil and 2-acetylpyridine-4-dimethylaminoanil.

3,927,138
PROCESSES FOR DEHYDROGENATION OF HYDROCARBONS

Darrell W. Walker, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 374,649, June 28, 1973, abandoned, which is a division of Ser. No. 140,967, May 6, 1971, Pat. No. 3,790,501. This application Aug. 14, 1974, Ser. No. 497,290
Int. Cl.² C07C *5/48*
U.S. Cl. 260—680 E **7 Claims**

1. A process for the dehydrogenation of a hydrocarbon feedstock having 2 to 12 carbon atoms and at least one

grouping which comprises contacting said feedstock in the vapor phase under dehydrogenation conditions in the presence of molecular oxygen with a catalyst comprising

from 20 to 75 weight percent of at least one ferrous metal selected from the group consisting of nickel, cobalt and iron;

from about 1 to about 50 weight percent of tin;

from about 0.5 to about 12 weight percent of phosphorus; and

at least one alkali metal in an amount equivalent, on an atomic basis, to about 0.5 to about 6 weight percent of potassium;

wherein at least one of said ferrous metal, said tin, said phosphorus and said alkali metal is associated with oxygen.

3,927,139
METHOD OF FABRICATION OF FURAN RESIN BONDED FIBER REINFORCED ARTICLES BY SPRAY-UP TECHNIQUE

Keith B. Bozer, and Lloyd H. Brown, both of Crystal Lake, Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Nov. 26, 1973, Ser. No. 418,904
Int. Cl.² C08G *2/38, 6/00, 12/46;* C08L *61/26*
U.S. Cl. 260—829 **9 Claims**

1. A method of making a catalyzed furan binder mixture suitable for spray-up applications, said method comprising: continuously advancing a first liquid binder stream consisting essentially of a furan binder, and a second liquid catalyst stream comprising a catalyst selected from the group o-phthaloyl chloride and lauroyl chloride, and mixtures thereof, said furan binder consisting essentially of a preresinified liquid furan resin having a viscosity between about 500 and 25,000 cps. diluted with furfural in an amount of from about 5–25 percent inclusive by weight based on the weight of the binder, said liquid furan resins having been prepared from ingredients including compounds having one or more furan rings therein, and in which there is no more than one mole of any other respective polymerizable ingredient per mole of furan ring in the furan-ring-containing ingredients, said furan binder having a viscosity in the range between 200 cps. and 1,000 cps inclusive at 25°C.; continuously admixing the binder stream and catalyst stream in relative amounts such that a catalytically effective amount of the catalyst is admixed with said binder whereby a catalyzed binder mixture is formed; immediately discharging the catalyzed binder mixture as a spray into a discharging zone, said catalyst being admixed in an amount of at least 0.5 percent expressed as percent hydrolyzable chloride, based on the weight of the catalyzed binder mixture.

3,927,140

ADHESIVE COMPOSITION

James T. Rice, and Chia M. Chen, both of Athens, Ga., assignors to Research Corporation, New York, N.Y.

Filed Oct. 24, 1973, Ser. No. 409,312

Int. Cl.[2] C08L *61/06*

U.S. Cl. 260—838 5 Claims

1. A method for forming an aldehyde-phenolic condensation copolymer, which comprises:

forming an essentially linear and non-cross-linkable aldehyde condensation prepolymer having a viscosity of 5 cps to 75 cps at 25°C by reacting an aldehyde selected from the group consisting of formaldehyde acetaldehyde, benzaldehyde, propionaldehyde, butyraldehyde, furfuraldehyde, and mixtures thereof with a phenolic compound selected from the group consisting of phenol, resorcinol, xylenol and cresol in a mole ratio of aldehyde to phenolic compound of 0.5 : 1 to 1.5 : 1 in water in amounts of 25% to 75% based on the total weight of materials in the presence of a catalyst of the hydroxide or carbonate compounds of alkali metals or alkaline earth metals, ammonium hydroxide or ammonium carbonate;

forming a highly thermosettable and cross-linkable aldehyde condensation aldehyde condensation prepolymer having a viscosity of 5 cps to 75 cps at 25°C, by reacting said aldehyde with said phenolic compound in a mole ratio of aldehyde to phenolic compound of 2.0 : 1 to 3.0 : 1 in water in amounts of 25% to 75% based on the total weight of materials in the presence of said catalyst;

admixing from 90% – 10% by weight of said linear aldehyde prepolymer with 10% – 90% by weight of said highly thermosettable prepolymer; and

copolymerizing said admixture at a temperature of 60°C to the reflux temperature in the presence of said base in amounts of 0.05 to 0.8 moles per mole of phenolic compound which results in a copolymer having a viscosity of 30 to 3,000 cps at 25°C.

3,927,141

POLYAMIDE BASE POWDER COATING MATERIAL CONTAINING AN AMINOPLAST CARRYING ALKOXYALKYL GROUPS

Rainer Feldman; Uwe Biethan; Karl Adolf Müller, all of Marl, and Hans Joachim Panoch, Hullern, all of Germany, assignors to Chemische Werke Huls Aktiengesellschaft

Filed Apr. 24, 1973, Ser. No. 354,072

Claims priority, application Germany, May 5, 1972, 2222123

Int. Cl.[2] C08L *61/20*

U.S. Cl. 260—849 14 Claims

1. Polyamide base powder compositions consisting essentially of a plurality of finely divided particles, said plurality of finely divided particles being uniform, or a mixture of distinct particles, said plurality of finely divided particles having therein on an average:

a. about 95 to 99.8 percent by weight of polyamide with an average of 8 to 11 aliphatically linked carbon atoms per amide group;

b. about 0.2 to 5 percent by weight of an aminoplast bearing alkoxyalkyl groups; and

c. about 0.01 to 2 percent by weight, relative to the sum of (a) and (b), of a catalyst which has an acidic reaction at the film forming temperature.

3,927,142

PROCESS FOR THE PREPARATION IMPACT RESISTANT STYRENE POLYMERS

Wolfgang Strobel, Hofheim, Taunus; Ottokar Jaenicke, Schafbruck, Saar; Horst-Dieter Schüddemage, Weilbach, Taunus, and Horst Jastrow, Niederhochstadt, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 19, 1973, Ser. No. 425,974

Claims priority, application Germany, Dec. 21, 1972, 2262610

Int. Cl.[2] C08L *23/16;* C08F *255/06*

U.S. Cl. 260—878 R 7 Claims

1. Process for the preparation of impact resistant styrene graft copolymers by polymerization of

a. 98 to 80 percent by weight of a mixture of

aa. 90 to 70 percent by weight of at least one monomer selected from the group consisting of styrene, vinyl toluene, vinyl xylene, chloro-styrene, bromo-styrene, vinylcyclohexane, methylvinylcyclohexane and halogenvinyl cyclohexane with

ab. 10 to 30 percent by weight of at least one monomer selected from the group consisting of acrylonitrile, methacrylonitrile, a low aliphatic alcohol ester of acrylic acid, methacrylic acid, itaconic acid, maleic acid, and fumaric acid in admixture with

b. 2 to 20 percent by weight of an ethylenepropylene-ter-component-rubber, (aa) and (ab) being calculated, in percent by weight, on the total quantity of the monomers (aa) + (ab) and (a) and (b) on the total quantity of monomers a) [(=aa) + (ab)] + rubber (b),

in the presence of at least one monomer soluble, organic peroxide in the mass or in mass/suspension, wherein the mixture of (aa) and (ab) with (b) is polymerized, after dissolving the ethylene-propylene-ter-component-rubber in at least one member of said group recited in (aa), and thereafter adding at least one member of said group recited in (ab) within an (aa) / (ab) ratio, in percent by weight, of 6/1 to 4/1 at a temperature of 85° to 115°C, until the end of the phase transition, and the polymerization is completed after a further addition of

i. at least one monomer from the group consisting of monomers, recited in (aa) or (ab) or

ii. a mixture of (aa) and (ab) for the polymerization mass to fall within the recited ratio of aa) to ab).

3,927,143

THERMOPLASTIC BLOCK COPOLYMERS

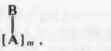
Henry S. Makowski, Scotch Plains, and Donald J. Buckley, Sr., Plainfield, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Oct. 12, 1973, Ser. No. 405,920

Int. Cl.[2] C08L *25/08, 25/16;* C08K *5/01, 5/12*

U.S. Cl. 260—886 27 Claims

1. Thermoplastic copolymers wherein said copolymer is selected from the group consisting of block copolymers having the general formulae (I) A—B—A, (II) A—B—A—B—A and (III) xB—[A—B]$_n$—yA, and graft copolymers having the general formula (IV)



wherein *m* and *n* are integers greater than or equal to 2; *x* and *y* are 0 or 1, and *y* is 0 when *n* is 2; and A and B are mutually incompatible vinyl aromatic polymer blocks having a solubility parameter difference of greater than 0.7.

3,927,144

ELASTOMER COMPOSITION

Noriyuki Hayashi; Kenji Sasaki, both of Kodaira; Hideaki Inaba, and Koushi Nonaka, both of Higashimurayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of Ser. No. 117,824, Feb. 22, 1971, abandoned. This application Mar. 1, 1973, Ser. No. 337,929

Claims priority, application Japan, Feb. 20, 1970, 45-14179

Int. Cl.[2] C08F *240/00;* **C08L** *9/06, 23/20*

U.S. Cl. 260—888 **7 Claims**

1. A vulcanized composition in the form of a tire tread comprising (A) 100 parts by weight of a styrene-butadiene elastomeric copolymer and (B) 5 to 40 parts by weight of a petroleum resin which is a copolymer of (1) a cyclic diene monomer selected from the group consisting of cyclopentadiene, dicyclopentadiene and mixtures thereof, (2) a copolymerizable vinyl substituted aromatic hydrocarbon monomer having up to 12 carbon atoms and optionally (3) another copolymerizable olefinic monomer having 4–12 carbon atoms and selected from the group consisting of mono-and di-olefinic aliphatic hydrocarbons, said cyclic diene monomer content of said petroleum resin copolymer being at least 30 weight % and said petroleum resin copolymer having a softening resin of 50 to 200°C. and a bromine value of 40 to 150.

3,927,145

FLAME RESISTANT POLYOLEFINS

Bruno L. Gaeckel, Westmount, and Hans R. Larsen, Montreal, both of Canada, assignors to Union Carbide Canada Limited, Toronto, Canada

Filed Oct. 29, 1974, Ser. No. 518,644

Int. Cl.[2] C08L *23/08*

U.S. Cl. 260—897 B **7 Claims**

1. A polyolefin composition having improved flame resistant characteristics which comprises polyethylene blended with from 5 to 15% by weight of hexabromobiphenyl; from 2 to 15% by weight of antimony trioxide and from 5 to 50% by weight of a copolymer of ethylene and one selected from the group consisting of vinyl acetate, acrylic acid and ethyl acrylate, the weight percentages based on the weight of the polyethylene.

3,927,146

COMPOSITIONS COMPRISING MIXTURES OF HYDROGENPHOSPHONATES AND METHYLPHOSPHONATES

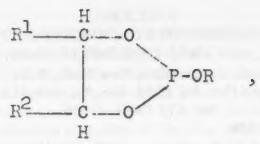
Wadim Batorewicz, New Haven, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 440,411, Feb. 7, 1974, abandoned. This application Dec. 23, 1974, Ser. No. 535,749

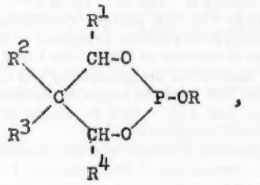
Int. Cl.[2] C07F *9/40*

U.S. Cl. 260—921 **4 Claims**

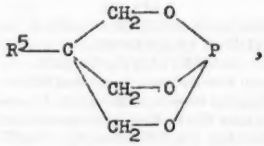
1. A mixture of hydrogenphosphonates and methylphosphonates obtained by reacting a cyclic phosphite selected from the group having the structure

I 

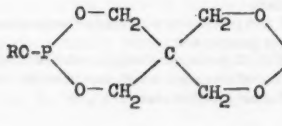
wherein R^1 and R^2 may be the same or different and are hydrogen, alkyl or haloalkyl having from 1 to 6 carbon atoms, and R is alkyl or haloalkyl having from 1 to 10 carbon atoms, aryl or haloaryl having from 6 to 10 carbon atoms, alkaryl or aralkyl having from 7 to 12 carbon atoms wherein the alkaryl and aralkyl groups can also contain halogen substituents, or alkylene having from 2 to 6 carbon atoms linking two cyclic phosphites of said structure I;

II 

wherein R^1, R^2, R^3 and R^4 have the same meaning as R^1 and R^2 above, and R is alkyl or haloalkyl having from 1 to 10 carbon atoms, aryl or haloaryl having from 6 to 10 carbon atoms, or alkaryl or aralkyl having from 7 to 12 carbon atoms wherein said alkaryl and aralkyl groups may also contain halogen substituents;

III 

wherein R^5 is alkyl or hydroxyalkyl having from 1 to 4 carbon atoms; and

IV 

wherein R has the same meaning as set forth under structure II; with 2 to 5 moles of methanol per cyclic phosphite equivalent at a temperature of from 50° to 130° C. in the presence of an acid catalyst selected from the group consisting of sulfuric acid, alkylsulfonic acids and arylsulfonic acids, said catalyst being present in an amount of from 0.1 to 10 percent per mole of said cyclic phosphite.

3,927,147
HALOALKOXY DERIVATIVES OF THE CYCLOPHOSPHONITRILIC CHLORIDE-HEXAMETHYLPHOSPHORAMIDE ADDUCT

Robert M. Murch, Ashton, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 25, 1974, Ser. No. 436,778
Int. Cl.² C07F 9/141, 9/50
U.S. Cl. 260—927 N **1 Claim**

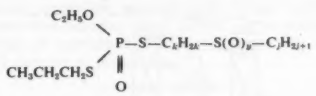
1. An additive for enhancing the fire retardance characteristics of general purpose polyester resins comprising an alkoxy derivative formed by the reaction of an alcohol selected from the group consisting of β-chloroethanol, 3,3,3-trichloroethanol, 2,3-dibromopropanol and 1,3-dichloro-2-propanol with the adduct of $(PNCl_2)_3$ and $(Me_2N)_3PO$.

3,927,148
O,S'-DIALKYL-S-HYDROCARBYLTHIOALKYL DITHIOPHOSPHATES

Alexis A. Oswald, Mountainside, and Paul L. Valint, Jr., Woodbridge, both of N.J., assignors to Exxon Research & Engineering Company, Linden, N.J.

Division of Ser. No. 173,267, Aug. 19, 1971, abandoned, which is a continuation of Ser. No. 821,117, May 1, 1969, abandoned. This application July 9, 1973, Ser. No. 377,874
Int. Cl.² C07F 9/165; A01N 9/36
U.S. Cl. 260—948 **10 Claims**

1. A compound of the general formula:



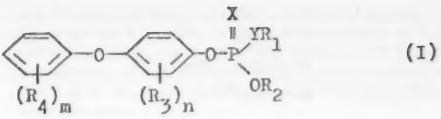
wherein k and j are from 1 to 4, and y is 0 to 2.

3,927,149
O-(METHYL OR ETHYL)-O(S) LOWER ALKYL-O-(4-PHENOXYPHENYL)PHOSPHATES

Odd Kristiansen, Mohlin, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

Filed May 6, 1974, Ser. No. 466,923
Claims priority, application Switzerland, May 11, 1973, 6721/73
Int. Cl.² C07F 9/165; A01N 9/36
U.S. Cl. 260—951 **15 Claims**

1. A compound of the formula



(I)

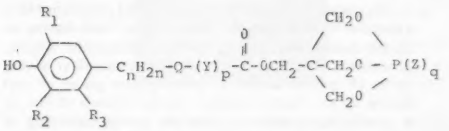
wherein R_1 represents alkyl with 1 to 7 carbon atoms, R_2 represents methyl or ethyl, R_3 and R_4 each represents hydrogen, nitro or halogen, $m = 1$ to 5 and $n = 1$ to 4, and X and Y each represents oxygen or sulphur.

3,927,150
BICYCLIC PHOSPHORUS COMPOUNDS

Kurt Schwarzenbach, Aesch, and Siegfried Rosenberger, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 21, 1973, Ser. No. 399,787
Claims priority, application Switzerland, Sept. 26, 1972, 14119/72
Int. Cl.² C07F 9/15; C08K 5/53
U.S. Cl. 260—937 **12 Claims**

1. A compound of the formula



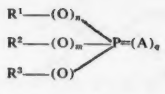
wherein
R_1 denotes alkyl of 1 to 5 carbon atoms,
R_2 denotes hydrogen or alkyl of 1 to 5 carbon atoms,
R_3 denotes hydrogen or methyl,
Q denotes —O—, —NH—, —NHCO—, —OCO— or —NHCONH—,
Y denotes $—CH_2—$ or $—CH_2CH_2SCH_2—$,
Z denotes oxygen or sulfur,
n denotes 0 to 4,
p denotes 0 or 1, and
q denotes 0 or 1.

3,927,151
PROCESS FOR THE PREPARATION OF PHOSPHORUS-ONTAINING COMPOUNDS

Roshdy Ismail, Neunkirchen; Arnold Lenz, Cologne-Stammheim, and Erich Termin, Niederkassel, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Germany

Continuation of Ser. No. 7,990, Feb. 2, 1970, abandoned. This application Feb. 1, 1973, Ser. No. 328,799
Claims priority, application Germany, Feb. 1, 1969, 1905095
Int. Cl.² C07F 9/08, 9/16, 9/40
U.S. Cl. 260—975 **20 Claims**

1. Process for the preparation of phosphorus-containing compounds of the general formula



in which A is oxygen or sulfur; q, m and n are 0 or 1; R^1, R^2 and R^3, which may be the same or different, are straight-chained or branched chain alkyl, cycloalkyl or aryl wherein R^1 may be substituted with one or more halogen atoms, which process comprises reacting a phosphorus compound of the general formula

in which A and q have the same meanings as above, Z and Y can be chlorine or bromine or Z and Y can be R^1, or R^2 as defined above or R^1O— or R^2O—, respectively, where R^1 and R^2 are defined as above and X can be chlorine or bromine, with a compound of the general formula

D — OH

in which D is R^1, R^2 or R^3as defined above, wherein the temperature at the commencement of the reaction is between 0°C and the boiling points of the reactants and where the temperature is increased during the reaction up to the boiling point of the reaction product formed and wherein the reaction pressure is simultaneously lowered to 200–10 mm.Hg. in the presence of an organo oxy compoud catalyst which catalyst is either

a. a compound having the formula $Me(OR)_x$ wherein Me is a metal of Groups II or V of the Periodic Table having an atomic number between 12 and 83 or zirconium, silicon, germanium or hafnium, R is alkyl or aminoalkyl having up to 18 carbon atoms, a cycloaliphatic group or aryl having up to 7 carbon atoms, x is the valence of Me, or

b. a compound selected from the group consisting of titanium acetylacetonate, vanadium-III acetylacetonate, zirconium acetylacetonate, vanadium oxy diacetyl acetonate, vanadium triacetyl acetonate, vanadium-IV-acetylacetonate, arsenic acetylacetonate, vanadylisopropylate, vanadyl n-butylate, vanadyl propylate, magnesium methyl glycolate, calcium methyl glycolate, zirconium oleate and manganese acetylacetonate

the catalyst concentration being from 0.001 to 2percent by weight based on the weight of the phosphorus reactant used.

3,927,152

METHOD AND APPARATUS FOR BUBBLE SHEARING

Gilbert M. Kyrias, Littleton, Colo., assignor to FMC Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 123,693, March 12, 1971, abandoned. This application Feb. 11, 1974, Ser. No. 441,573

Int. Cl.² B01F *3/04*

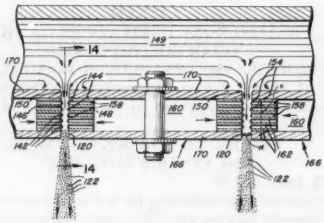
U.S. Cl. 261—122 **127 Claims**

1. Bubble shearing apparatus for diffusing fine gas bubbles into a body of liquid which comprises:

a gas transmitting body having a plurality of gas transmitting passages extending therethrough, each of said passages terminating in a capillary opening at a gas diffusing surface of said body, substantially all said capillary openings having a diameter of no more than about 100 microns;

means for providing a flow of gas through said gas transmitting passages and out said plurality of capillary openings to form nascent gas bubbles;

a slot-defining member spaced from said gas diffusing surface to form with said surface a shearing liquid transmitting slot having an inlet end, and a discharge end out of which shearing liquid may be discharged into said body of liquid, the shape, dimensions and spacing of said gas transmitting body and said slot-defining member being adapted, when water at 20°C. flowing through said slot with a mean entrance velocity of 10 feet per second is employed as the shearing liquid and no gas is flowing through said gas transmitting passages, to establish laminar flow in said water that is substantially parallel to the contour of said gas diffusing surface, including a partially developed laminar boundary layer immediately adjacent said gas diffusing surface with a free stream above said layer over at least a substantial portion of said capillary openings, the water over any remaining portion of said



capillary openings being substantially free of any type of flow other than fully developed substantially parallel laminar flow; and

means for providing a flow of liquid through said slot at a velocity to produce in water substantially parallel laminar flow as described above, to shear said nascent gas bubbles from said capillary openings as the liquid in said flow that is in contact with said gas diffusing surface moves past said openings, the flow of liquid through said slot carrying said sheared gas bubbles out of said slot at its discharge end and into said body of liquid.

3,927,153

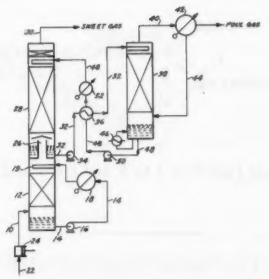
PROCESS FOR DIRECT COOLING OF CORROSIVE INDUSTRIAL CASES

Mehmet Orhan Tarhan, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Aug. 14, 1973, Ser. No. 388,504

Int. Cl.² B01F *3/04*

U.S. Cl. 261—128 **3 Claims**



1. A method of cooling, in a cooling unit, a hot industrial gas having an acid gas component and an initial temperature of not less than about 100° C comprising:

a. providing a liquid coolant chemically inert to said acid gas component,

b. passing said gas at said initial temperature and at a controlled flow rate upwardly through said cooling unit,

c. introducing said coolant at a first temperature of below about 50° C and at a controlled flow rate into said cooling unit adjacent the upper end thereof,

d. passing said coolant downwardly through said cooling unit in a manner to cause direct contact between said coolant and said gas,

e. adjusting the controlled flow rate of said gas and of said coolant in a manner to cool said gas in said chamber from said initial temperature to a final temperature of about 20° to 50° C and to heat said coolant liquid from said first temperature to a second temperature not lower than about 90° C so that absorption of corrosive amounts of the said acid gas component by the liquid coolant is inhibited,

f. cooling said heated coolant from said second temperature to said first temperature, and

g. recycling said coolant to said upper end of said cooling unit of step (c).

3,927,154
PROCESS FOR PREPARING SINTERED URANIUM DIOXIDE NUCLEAR FUEL

Ralph E. Carter, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 85,727, Oct. 30, 1970, abandoned, which is a continuation-in-part of Ser. No. 749,994, Aug. 5, 1968, abandoned. This application Feb. 26, 1973, Ser. No. 336,022

Int. Cl.² G21C *21/00*

U.S. Cl. 264—.5 **7 Claims**

1. A sintering control process wherein the sintering atmosphere contains substantially contantly a predetermined monitored oxygen partial pressure which maintains a body consisting essentially of uranium dioxide at a preselected oxygen to uranium ratio during sintering of such body in the production of a urnanium dioxide nuclear fuel body having said preselected oxygen to uranium ratio comprising the steps of providing uranium dioxide particles having an oxygen to uranium atomic ratio of 1.7 to 2.25 and a surface area ranging from about 2 to 12 square meters per gram, pressing said uranium dioxide particles to form a green body, heating said green body to a sintering temperature ranging from about 1000°C to 1400°C in a chemically buffered sintering gas atmosphere consisting essentially of a gas mixture of at least two gases, which are maintained in a ratio which in equilibrium at said sintering temperature provides said predetermined monitored oxygen partial pressure to maintain the uranium dioxide at said preselected oxygen to uranium ratio during sintering, and sintering said body at said temperature, said oxygen partial pressure being solely predetermined by said preselected oxygen to uranium ratio and said sintering temperature, said preselected oxygen to uranium ratio being a minimum of 2.005, and said sintering being carried out to produce a sintered body of uranium dioxide having a density of at least about 92 percent of theoretical.

3,927,155
METHOD FOR PRODUCING PARTICULATE MATERIAL AND CERAMIC BODIES THEREFROM

Raymond Edward Jaeger, Basking Ridge, and Thomas John Miller, Greenbrook, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 180,504, Sept. 14, 1971, abandoned. This application Dec. 17, 1973, Ser. No. 425,183

Int. Cl.² B01J *2/06*

U.S. Cl. 264—6 **4 Claims**

1. The method of forming a metal oxide ceramic body avoiding any intermediate hydroxide state, comprising

a. preparing a metal salt solution, consisting of a first liquid and a metal salt which can be transformed to a metal oxide by heating,

b. forming droplets of the said solution,

c. introducing the said droplets into a body of a drying liquid, which drying liquid is miscible with the said first liquid, but in which drying liquid the metal salt is less than one percent soluble, the relative proportions of metal salt, first liquid and drying liquid being such that a substantial quantity of the metal salt is insoluble in the resulting solution of first and drying liquids, and the metal salt being one which upon interdiffusion of said first and drying liquids crystallizes in the form of metal salt particles avoiding any intermediate hydroxide state,

d. recovering the crystallized metal salt particles,

e. heating the recovered crystallized metal salt particles to convert them to metal oxide particles,

f. pressing said metal oxide particles into a compact unitary body, and

g. firing said compact unitary body at a sintering temperature to convert said body into a metal oxide ceramic body.

3,927,156
PRODUCTION OF INK-FEEDING AND WRITING CORE FOR WRITING INSTRUMENT

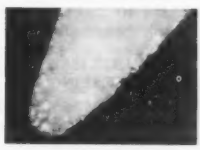
Shinsuke Yoshikawa; Hiroyuki Endo, and Shuji Terasaki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonba, Japan

Continuation-in-part of Ser. No. 75,327, Sept. 25, 1970, abandoned. This application Feb. 15, 1973, Ser. No. 332,757

Claims priority, application Japan, Sept. 30, 1969, 44-77385; Oct. 8, 1969, 44-79954; Oct. 8, 1969, 44-79955; May 22, 1970, 45-43262

Int. Cl.² B29C *1/14*

U.S. Cl. 264—15 **2 Claims**



1. A method for producing a porous ink-feeding writing instrument core from polyvinylidene fluoride spherical particles having an inherent viscosity of 1.0 to 4.0 when measured in 0.4g/100 cc solution of N,N′-dimethylformamide, a bulk density of 0.5–1.0 g/ml and a size range of 10–300 microns, comprising:

a. placing said particles in a metal mold having the shape of a pen core;

b. heating said particles in a pressure free state to a temperature between the melting point and 350°C, wherein said particles, due to their inherent viscosity, retain their general shape with interstices therebetween;

c. cooling said molten particles to solidify same into the shape of said pen core;

d. removing said pen core from said mold;

e. placing the pen core in a furnace;

f. heating said pen core in the furnace at a temperature between the melting point and 70°C for more than 3 hours; and

g. cooling said pen core to produce therein a porosity of 30–50%.

3,927,157
HIGH TEMPERATURE RESISTANT PRODUCTS AND METHODS FOR MAKING THE SAME

Paul F. Vasterling, Westminster, Calif., assignor to HITCO, Irvine, Calif.

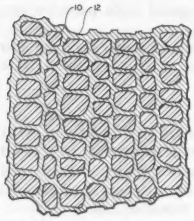
Continuation-in-part of Ser. No. 851,946, Aug. 21, 1969, abandoned. This application July 26, 1971, Ser. No. 165,971

Int. Cl. C01b *31/07*

U.S. Cl. 264—29 **4 Claims**

1. A method for producing carbon fibers suitable for molding compositions comprising leaching *Larix occidentalis* fibers to remove soluble carbohydrates and form small porous cellular fibrous structures of substantially non-uniform size and

shape, the fibrous structures being between about 1/8 and 1 inch and between about 0.02 inch and 0.25 inch in diameter, initially carbonizing the fibers at temperatures reaching between about 1800° and 2400° F. and thereafter stabilizing the



leached carbonized fibers at temperatures between about 3800° and 5500° F. in a non-oxidizing atmosphere while retaining the original shapes of the porous cellular fibrous structures.

3,927,158

METHOD OF RESEALING PIPE JOINTS

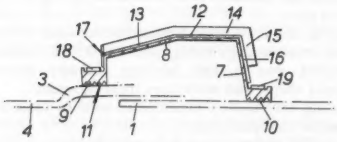
Robert Croft, Bradford-on-Avon, and Raymond Lippiatt, Trowbridge, both of England, assignors to Avon Rubber Company Limited, Melksham, England

Filed Mar. 19, 1973, Ser. No. 342,333

Claims priority, application United Kingdom, Mar. 20, 1972, 12982/72

Int. Cl.² B29F *1/06*

U.S. Cl. 264—36 **8 Claims**



1. In a method of encapsulating a joint between hollow members for conducting a fluid under pressure, wherein a mould is fitted externally around the joint to define a mould cavity of greater transverse section than any part of the joint and a fluent encapsulant is injected into the mould, the improvement consisting of sealing the mould in gas-tight fashion to the hollow members at each axial side of the joint, applying a pressure within the mould before the completion of injection of encapsulant which is at least as great as the pressure within the hollow members, at least maintaining such a pressure until hardening of the encapsulant, the pressure within the mould being controlledly applied and maintained by gas under pressure supplied from outside the mould before, during and after injection of encapsulant and until hardening of the encapsulant, and removing the mould to leave a sealed joint surrounded externally by hardened encapsulant.

3,927,159

METHOD OF FORMING A DIMENSIONALLY ACCURATE FOAMED POLYETHYLENE RESIN PRODUCTS

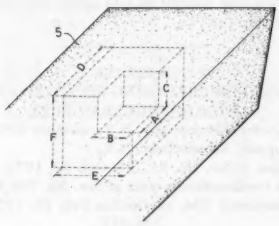
Masami Tomikawa; Hideo Ohkawa, and Akiji Tsunoda, all of Chiba, Japan, assignors to Idemitsu Kosan Company Limited, Japan

Filed Oct. 29, 1973, Ser. No. 410,335

Claims priority, application Japan, Nov. 9, 1972, 47-111640

Int. Cl.² B29D *27/00*

U.S. Cl. 264—45.3 **6 Claims**



1. Method of preparing a foamed polyethylene resin product which accurately conforms to the dimensions of a mold cavity, which comprises the steps of:

a. mixing together 100 weight parts of polyethylene resin, from 30 to 70 weight parts of an inorganic calcium compound selected from the group consisting of calcium sulfite, calcium sulfate and calcium carbonate, from 1.5 to 6.0 weight parts of a foaming agent and from 0.15 to 0.5 weight parts of a cross-linking agent,

b. charging the mixture resulting from step (a) to a closed mold with a predetermined shape;

c. foaming said mixture in the mold under a pressure at an elevated temperature; and

c. subsequently opening the mold instantaneously.

3,927,160

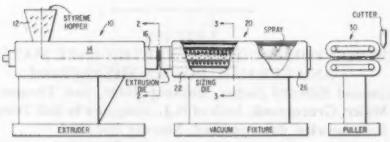
FORMAL PROFILE EXTRUSION PROCESS

Ronald D. Medley, Big Spring, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.

Filed July 17, 1973, Ser. No. 380,009

Int. Cl.² B29D *27/00*; B29F *3/06*

U.S. Cl. 264—45.5 **5 Claims**



1. A process for the manufacture of profiled products having a specific gravity of from about 0.3 to 0.6 by extruding in a substantially non-expanded state an expandable styrene polymer composition through a die orifice having the desired profile and subsequently passing the extruded material through a sizing member wherein said material expands to the desired profile and cross-section to produce an article having a non-foamed outer layer of stryene polymer and a foamed interior cross-section, said styrene polymer composition consists essentially of a styrene polymer and a blowing agent consisting essentially of about 180 grams of sodium bicarbonate and from about 50 to 100 grams of citric acid per 100 pounds of styrene polymer.

3,927,161
PROCESS FOR MANUFACTURING FOAM PADDED SKINNED ARM RESTS AND CRASH PADS

Richard E. Powell, Milford, and Robert W. Starck, Sears, both of Mich., assignors to Sheller-Globe Corporation, Toledo, Ohio

Filed Nov. 12, 1973, Ser. No. 415,213
Int. Cl.[2] B29D *27/04, 7/00, 9/00*
U.S. Cl. 264—46.6 **3 Claims**

1. A process of manufacturing foam padded, skinned flexible products suitable for use on automotive vehicles and the like,

comprising the steps of,

providing a vinyl plastic resin in the form of fine particles operative to provide a finished product with good appearance and flexibility,

said vinyl plastic resin particles being formed from a formulation comprised of (a) a polyvinyl chloride resin, at least one liquid plasticizer, a stabilizer, and a coloring material, and (b) a polyvinyl chloride drying resin, and said particles being prepared by the process of introducing a substantial portion of said part (a) into a mix and heating same, adding the balance of said part (a) to said mix under high agitation and heat conditions, then cooling said mix and adding a polyvinyl chloride drying resin under agitation conditions,

placing the vinyl plastic particles in a fluidized bed apparatus,

fluidizing the bed of vinyl plastic particles by passing a gas upwardly therethrough,

preheating and masking a mold shaped to a desired form of a skin which is to be formed therein,

immersing and rotating the masked mold in the bed to form the vinyl plastic skin in the mold, removing the mold and subjecting same to a post heating operation to cure the skin,

cooling the mold,

stripping the skin from the mold,

filling the skin in a second molding operation with a urethane foam forming material,

foaming said material to provide a product which is a urethane foam formed adherently within said vinyl plastic skin, and wherein, said preheating is to a temperature of about 450° to about 650° F.

3,927,162
METHOD OF MOLDING A POLYURETHANE FOAM INVOLVING USE OF A FAN-LIKE SPRAY NOZZLE

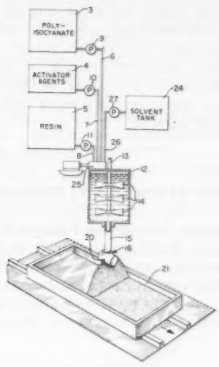
Robert J. Stalter, Sr., Bowling Green, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 20, 1973, Ser. No. 426,762
Int. Cl. B29d *27/04*
U.S. Cl. 264—51 **3 Claims**

1. A method of producing polyurethane foam comprising the steps of

1. forming a liquid foamable polyurethane reaction mixture comprising an organic polyisocyanate, a reactive hydrogen containing polymeric material having a molecular weight of about 550 to 6500 and blowing agent under a pressure of at least 0.5 to 200 pounds per square inch above atmospheric pressure; and

2. spraying the foamable polyurethane reaction mixture in a fan-like planular pattern of desired width across a mold

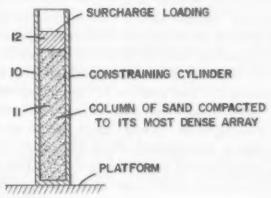


cavity while moving the mold and pouring head relative to each other to cover the surface of the mold cavity.

3,927,163
ALTERING THE PROPERTIES OF CONCRETE BY ALTERING THE QUALITY OR GEOMETRY OF THE INTERGRANULAR CONTACT OF FILLER MATERIALS

Lester H. Gabriel, Sacramento, and Wilfred Ernest Willis, San Francisco, both of Calif., assignors to Gabriel-Willis Associates, San Francisco, Calif.

Continuation-in-part of Ser. No. 792,370, Jan. 21, 1969, abandoned. This application Dec. 19, 1969, Ser. No. 886,556
Int. Cl.[2] B28B *1/08, 3/00*
U.S. Cl. 264—71 **34 Claims**



1. A method for preparing concrete comprising

dry mixing graded dry aggregate with dry cement composition in a preparation such that (1) the individual particles of the cement composition are uniformly smaller than the individual particles of the aggregate and are smaller than the individual void spaces between the adjacent aggregate particles of the cement free dry compacted aggregate, and (2) the bulk volume of dry compacted cement composition in the finished concrete is approximately equal to the bulk volume of total void space in the dry compacted cement-free aggregate,

filling the mold with the resultant dry mixture,

compacting the dry mixture in the mold to reduce substantially the volume of void space and to force the aggregate particles into direct contact with each other and the cement composition particles into the spaces between the aggregate particles,

providing a positive escape path for the air present in the compacted dry mixture,

adding water and distributing it with the aid of the inherent capillary action, of the mixture while preventing the water from blocking the escape path as long as there is air to escape by it, so that the water sweeps the air from the

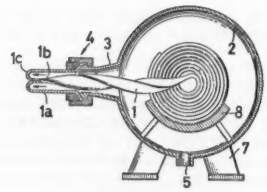
remaining voids and ejects that air by means of the positive escape path into the atmosphere, the amount of water added being determined by the inherent capillary action which ceases when the initially remaining voids have had their air replaced with the water, and

curing the resultant wet compact mixture in the mold until it has gained sufficient strength for safe removal, said curing resulting in preloading of the points of contact between the aggregate particles by virtue of shrinkage of the hydrating cement.

3,927,164
METHOD FOR TURNING A FLEXIBLE TUBE INSIDE OUT

Seiki Shimabukuro, c/o Ashimori Kogyo Kabushiki Kaisha, No. 15, 4-chome, Yokobori, Higashiku, Osaka, Osaka, Japan

Filed July 25, 1973, Ser. No. 382,366
Claims priority, application Japan, July 25, 1972, 47-74341
Int. Cl.² B29C *17/00, 17/02*
U.S. Cl. 264—95 **9 Claims**



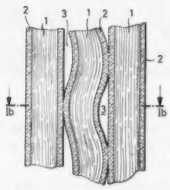
1. A method of manufacturing a flexible tube provided with an inner lining having a uniform thickness substantially free of imperfections which comprises applying a coating to the external surface of the flexible tube, placing the flexible tube which has been wound into a coil and which has one closed terminal end thereof into a confined chamber containing an exhaust nozzle, drawing out said other terminal end from the core of the coiled flexible tube without permitting any rotation of the coil, thereby inherently producing a twist in the flexible tube, turning the end portion of said other terminal end of the flexible tube inside out and fixing said other terminal end portion having been turned inside out to said exhaust nozzle, introducing a pressurizing fluid into said confined chamber, thereby inflating and evaginating the flexible tube to an almost circular cross-sectional shape as it is propelled from the chamber, while at the same time compressing that portion of the flexible tube still remaining unevaginated said evaginated portion and said unevaginated portion being separated by a turning point which continually shift from the fixed terminal end to its closed terminal end over the entire length of the flexible tube, wherein the drawing of the flexible tube through the exhaust nozzle in a twisted state reduces the size of the flexible tube which in turn reduces the frictional resistance of the flexible tube as it passes through the inside of the evaginated tube and as it is evaginated through the exhaust nozzle.

3,927,165
NON-CORROSIVE REGULAR PACKING MEMBER AND A METHOD OF MAKING SAME

Jan Grochol, Winterthur, and Werner Meier, Elgg, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 16, 1974, Ser. No. 470,446
Claims priority, application Switzerland, May 23, 1973, 7304/73
Int. Cl.² 264 *134;* **B29H** *9/02;* **B32B** *17/02*
U.S. Cl. 264—129 **3 Claims**

1. A method of making a regular packing member for material exchange columns and heat exchangers, the said regular packing member having walls defining flow channels therein, each said wall including a non-self-supporting base material of glass fibers, comprising the steps of wetting a flat structure of said glass fibers with a glass-forming ionotropic sol consisting of charged colloidal particles and containing at least one glass



forming oxide selected from the compounds of silicon, aluminum, zirconium, and titanium which enters into a chemical compound with the glass fibers of the fabric layer, thereafter shaping and drying the wetted structure at a temperature of 300°C or less to form an irreversible stiffened packing member structure.

3,927,166
METHOD FOR PELLETIZING COMPOSITIONS COMPRISING A NON-CRYSTALLINE OLEFINIC POLYMER OR COPOLYMER, AND A SURFACTANT

Sadamichi Tomoda, Kanagawa, and Nobuo Nagao, Yokohama, both of Japan, assignors to Chiba Fine Chemical Co. Ltd., Ichihara, Japan

Filed Apr. 3, 1970, Ser. No. 25,563
Claims priority, application Japan, Apr. 11, 1969, 44-28121
Int. Cl.² B01J *2/00*
U.S. Cl. 264—144 **7 Claims**

1. An improved method for producing pellets of a material selected from the group consisting of non-crystalline olefinic polymers and non-crystalline olefinic copolymers and mixtures thereof, said material being a by-product of the production of crystalline olefinic polymers and having an average molecular weight of 10,000 to 40,000 which consists essentially in mixing said material with a surfactant selected from the group consisting of anionic, cationic, nonionic or ampholytic surfactants in an amount of 1 to 30% by weight based upon the total weight of the resultant mixture, melt-extruding the resulting mixture and cooling, solidifying and pelletizing the resulting melt-extrudate, the temperature of the melt at the exit of the melt-extruding means being within the range of 90° to 220°C.

3,927,167
PRODUCTION OF MIXED SHRINKAGE POLYESTER YARN

Cecil E. Reese, Kinston, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 26, 1972, Ser. No. 292,300
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² D01D *5/12*
U.S. Cl. 264—210 F **4 Claims**

1. In the production of continuous-filament textile yarns, wherein polyester filaments are melt-spun from spinneret orifices, quenched, combined into a yarn, drawn to at least the natural draw ratio and heat-set, the improvement for preparing mixed-shrinkage, heat-bulkable yarn, wherein the improved process comprises forming filaments having a relative viscosity of 14 to 19 by melt-spinning a polyester, wherein 95 to 100 mole percent of the repeating structural units are ethylene terephthalate and 5 to 0 mole percent of the structural units are ethylene 5-(alkali metal sulfo)-isophthalate, simultaneously forming filaments having a relative viscosity between 27 and 40 by melt-spinning under the same condi-

tions a different type of polyester of ethylene terephthalate which includes other ester units to retard crystallization of the polyester, from 85 to 95 mole percent of the polyester structural units being ethylene terephthalate, quenching the 14 to 19 and 27 to 40 relative viscosity filaments under the same conditions and combining them into a yarn, then drawing the yarn about 4X and heat-setting the yarn at a temperature within the range of 130° to 160°C. to produce 14 to 19 relative viscosity filaments having a density of at least 1.3800, and 27 to 40 relative viscosity filaments having a density of less than 1.3840, a boil-off shrinkage greater than 7.5 percent and a break elongation within 15 percentage units of the 14 to 19 relative viscosity filaments.

3,927,168

OSMIUM RECOVERY FROM GLYCOL SOLUTIONS

William F. Whitehead, Lansdowne, and Ralph L. Rogers, Norwood, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 18, 1972, Ser. No. 316,184
Int. Cl. C01g *55/00*
U.S. Cl. 423—22 **5 Claims**

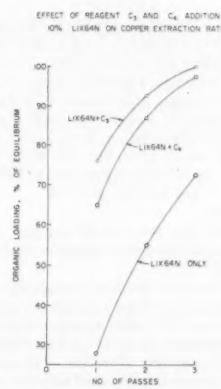
1. The method of separating osmium from an organic oxidation reaction mixture containing a polyhydric alcohol and obtained by the osmium catalyzed oxidation of an olefin which method comprises contacting the oxidation reaction mixture with an ozone containing gas which contains between about 1 and about 12 per cent by weight of ozone said ozone containing gas being a mixture of ozone and oxygen or a mixture of ozone and air and distilling the oxidation reaction mixture to recover osmium present in that mixture.

3,927,169

ION EXCHANGE PROCESS FOR THE RECOVERY OF COPPER

Mayer B. Goren, Denver, and Enzo L. Coltrinari, Arvada, both of Colo., assignors to Hazen Research, Inc., Golden, Colo.

Filed Mar. 11, 1974, Ser. No. 450,058
Int. Cl.² C01G *3/00*
U.S. Cl. 423—24 **17 Claims**



17. A process for recovering copper values from an aqueous medium comprising contacting the aqueous medium with a water-immiscible organic solvent having dissolved therein an extractant comprising:

a substituted hydroxy benzophenoxime having a solubility of at least 2% by weight in the organic solvent and as a copper extraction accelerating agent for the substituted hydroxy benzophenoxime a compound selected from the group consisting of thioglycolic acids and oxidation products of thioglycolic acids.

3,927,170

HYDROMETALLURGICAL RECOVERY OF COPPER NICKEL OR ZINC FROM SULPHIDE ORES BY OXIDATION IN AMMONIACAL CHLORIDE OR NITRATE SOLUTIONS

Percy Dixon, Glen Osmond, and David C. Madigan, Blackwood, both of Australia, assignors to Charles Harold Warman, New So. Wales, Australia

Filed Dec. 17, 1973, Ser. No. 425,062
Claims priority, application Australia, Dec. 18, 1972, 1663/72; Apr. 10, 1973, 2954/73
Int. Cl.² C01G *3/14, 9/00, 53/12;* **C01B** *17/02*
U.S. Cl. 423—33 **2 Claims**

1. A process for recovering from a sulfide ore or concentrate a metal selected from the group consisting of copper, nickel and zinc consisting essentially of passing oxygen through a suspension of the sulfide contained in aqueous ammonium chloride or ammonium nitrate of at least 1.5 molar concentration at or near atmospheric pressure and at or near ordinary atmospheric temperatures, the suspension having a pH at least 9.5.

3,927,171

ZEOLITE PRODUCTION

Louis D. Rollmann, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,566
Int. Cl.² C01B *33/28*
U.S. Cl. 423—118 **14 Claims**

1. The process for manufacture of a synthetic crystalline aluminosilicate molecular sieve zeolite which comprises contacting montmorillonite with an amount of water between about 9 and about 150 percent of the weight of montmorillonite, injecting the moisture-loaded montmorillonite into a zone maintained at an initial temperature of at least about 300°C. but not in excess of about 1100°C. with subsequent immediate heating to a temperature in the approximate range of 800° to 1100°c. where said initial temperature is below 800°C., maintaining the montmorillonite at a temperature within said approximate range of 800° to 1100°C. for at least about 1 hour, aging the thus treated montmorillonite in an alkali metal hydroxide solution until crystals of said zeolite form and removing said crystals from the reaction mixture.

3,927,172

METHOD OF CONCENTRATING GALLIUM

Harry M. Stevens, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 20, 1973, Ser. No. 333,928
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² C01G *15/00*
U.S. Cl. 423—129 **5 Claims**

1. A method of concentrating gallium from phosphorus furnace treater dust comprising:

A. contacting the treater dust with an aqueous slurry of an alkaline earth compound, the solution having a pH of greater than 11;

B. separating the alkaline liquid containing the gallium from the treater dust; and

C. recovering the gallium from the liquid.

3,927,173

TREATMENT OF ACID WASTE WATERS TO PRODUCE FERROMAGNETIC SLUDGES

Stephen F. Melzer, Fairfield, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed Feb. 22, 1974, Ser. No. 445,315
Int. Cl.² C01G *1/00*
U.S. Cl. 423—142 **26 Claims**

1. A process of treating at ambient temperature acid waste water containing iron values, said waste water being chosen

from the class consisting of hydrochloric acid waste waters, hydrochloric-hydrofluoric acid waste waters, sulfuric acid waste waters, sulfuric-hydrofluoric acid waste waters, hydrochloric-sulfuric acid waste waters and hydrochloric-sulfuric-hydrofluoric acid waste waters to produce hydrated magnetite, said process comprising the steps of adding to said waste water a neutralizing agent to achieve and maintain a final pH of the waste water of at least about 8 such that precipitation of the iron values will be substantially complete, aerating said waste, stopping said aeration when about two-thirds of the total of said iron values are oxidized, stirring said waste water at least during said aeration step.

3,927,174

METHOD FOR PRODUCING AMMONIA-BASE PULPING LIQUOR FROM SPENT LIQUOR

George G. Copeland, Western Springs, Ill., assignor to Copeland Systems Inc., Oak Brook, Ill.

Division of Ser. No. 209,861, Dec. 20, 1971, Pat. No. 3,864,192. This application Mar. 12, 1974, Ser. No. 450,329
Int. Cl.[2] D21C *11/02*
U.S. Cl. 423—155 10 Claims

1. The process which comprises:

combining an ammonia-base bisulfite spent pulping liquor with magnesia thereby freeing ammonia and forming a dilute spent liquor containing magnesium-base bisulfite spent liquor;

concentrating said dilute spent liquor containing magnesium-base bisulfite spent liquor by directly contacting said spent liquor with hot exhaust gases from a fluidized bed reactor to form a concentrated spent liquor containing magnesium-base bisulfite spent liquor;

feeding the concentrated spent liquor containing magnesium-base bisulfite spent liquor into the fluidized bed reactor, in which the bed contains magnesia, and burning the said liquor therein; and

recovering the hot exhaust gases from the fluidized bed reactor and feeding them into direct contact with additional dilute spent liquor containing magnesium-base bisulfite spent liquor formed as described to concentrate the same.

3,927,175

PURIFICATION OF CARBONATE PROCESS SOLUTIONS

Norman R. Garofano, Geddes, and Eugene B. Port, Solvay, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 771,598, Oct. 29, 1968, abandoned. This application May 24, 1971, Ser. No. 146,443
Int. Cl.[2] C01D *7/26;* B01D *15/06*
U.S. Cl. 423—206 12 Claims

1. A process for the reduction of organic contaminants in a carbonate process solution which comprises passing said process solution through a bed of activated carbon until the adsorption efficiencies of said bed for the removal of said organic contaminants is reduced to at least 75% of the original adsorptive capacity of the activated carbon bed prior to regeneration, regenerating said bed by subjecting said bed to an aqueous wash cycle which comprises passing a plurality of aqueous wash liquors through said bed until at least 60% of said adsorbed organic contaminants have been desorbed, wherein each succeeding aqueous wash liquor has an organic contaminant level lower than the previous aqueous wash liquor and the first aqueous wash liquor has an organic contaminant level lower than the carbonate process solution, and said aqueous wash liquors are maintained at a temperature between 50° to 95°.

3,927,176

PROCESS FOR THE REMOVAL OF WATER FROM GAS STREAMS

Roy Glen Turnbo, Deer Park, and Donald A. Keyworth, Houston, both of Tex., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Sept. 19, 1973, Ser. No. 398,606
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—210 8 Claims

1. The process for the removal of carbon monoxide and water from a gas stream that contains carbon monoxide and less than 1 mole percent of water that comprises the steps of

a. contacting said gas stream with a liquid sorbent that is a solution of $CuAlCl_4$.toluene in toluene at a temperature between about −10°C. and the boiling point of toluene at a pressure between about 0.5 atmosphere and 30 atmospheres, said sorbent containing sufficient $CuAlCl_4$.toluene to react with all of the carbon monoxide and water in the gas stream, thereby forming a solution containing CO:$CuAlCl_4$, $CuAlCl_4$.AlOCl.toluene, and $CuAlCl_4$.toluene in toluene;

b. separating said solution from the gas stream;

c. heating said solution at a temperature between 40° and 180°C. at a pressure of 0.1 atmosphere to 30 atmospheres to separate carbon monoxide from a solution that contains $CuAlCl_4$.toluene and $CuAlCl_4$.AlOCl.toluene in toluene;

d. cooling the solution that contains $CuAlCl_4$.toluene and $CuAlCl_4$.AlOCl.toluene to precipitate the $CuAlCl_4$.AlOCl.toluene;

e. separating the precipitated $CuAlCl_4$.AlOCl.toluene from the solution that contains $CuAlCl_4$.toluene, and

f. recycling the solution that contains $CuAlCl_4$. toluene to Step a).

3,927,177

REMOVAL OF NITROGEN OXIDES FROM GASEOUS MIXTURES USING AQUEOUS ALKALINE MANGANATE OR PERMANGANATE SOLUTIONS

Taijiro Okabe; Akitsugu Okuwaki, both of Sendai, and Shigetoshi Nakabayashi, Shinminato, all of Japan, assignors to Mitsubishi Kinzoku Kogyo Kabushiki Kaisha, Ote and Nippon Chemical Industrial Co., Ltd., Tokyo, both of, Japan

Filed Oct. 5, 1973, Ser. No. 403,974
Claims priority, application Japan, Oct. 6, 1972, 47-100512
Int. Cl.[2] C01B *21/00*
U.S. Cl. 423—235 4 Claims

1. A process for the removal of nitrogen oxides from a gaseous mixture containing such nitrogen oxides which comprises the steps of

1. contacting a gaseous mixture containing nitrogen oxide with an aqueous absorbent solution at a solution temperature of 0°C to 80°C, said aqueous absorbent solution consisting essentially of 0.1 to 20% by weight of a manganate or a permanganate of sodium or potassium, whereby the nitrogen oxides are absorbed into said aqueous absorbent solution and converted into a nitrate or nitrite and wherein the manganate or permanganate is converted into a manganese oxide,
2. separating the manganese oxide from the absorbent solution,
3. subjecting the manganese oxide to oxidation along with at least a stoichiometric amount of a nitrate by roasting in air at a temperature of 300° to 800°C to convert the manganese oxide into a manganate or permanganate, and 4. circulating the manganate or permanganate thus-regenerated to step 1.

3,927,178

SULFUR DIOXIDE REMOVAL FROM STACK GASES

John E. Jordan, Sheffield, Ala., and George M. Newcombe, Clifton, N.J., assignors to The United States of America as represented by the Tennessee Valley Authority and the Environmental Protection Agency, Washington, D.C.

Continuation of Ser. No. 313,251, Dec. 8, 1972, abandoned, which is a continuation of Ser. No. 243,636, April 13, 1972, now Defensive Publication No. T909,017. This application Nov. 8, 1974, Ser. No. 522,372

Int. Cl.[2] C01B *17/00*

U.S. Cl. 423—242 1 Claim

1. A closed loop process for removing SO_2 from waste gases comprising the steps of:

A. scrubbing said waste gases in a scrubber with a liquor comprosing a solution of ammonium sulfite, ammonium bisulfite, and ammonium sulfate;

b. transferring liquor that results from the scrubbing in step (a) supra to a stripper means;

c. adding to the liquor in said stripper ammonium bisulfate in sufficient quantity to cause removal of SO_2 from said liquor and formation of an ammonium sulfate slurry;

d. mixing said ammonium sulfate slurry formed in step (c) with gaseous ammonia evolved as described in step (h), infra, and a portion of the scrubber liquor, in an absorber means, so as to depress the solubility of ammonium sulfate in the resultant liquor and cause ammonium sulfate precipitate to form, said formation of said ammonium sulfate precipitate being effected without the addition of substantial amounts of external heat energy applied thereto for purposes of evaporating water therefrom;

e. cooling the resultant slurry to further depress the solubility of ammonium sulfate in the resultant liquor from step (d);

f. separating the cooled slurry into solid ammonium sulfate and liquid component;

g. recycling the liquid component to the scrubber;

h. converting the solid ammonium sulfate to ammonium bisulfate and gaseous ammonia;

i. recycling a portion of said ammonia to said absorber in step (d), and a portion to said scrubber.

3,927,179

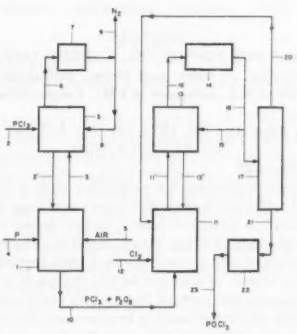
PROCESS FOR MANUFACTURING PHOSPHORUS OXYCHLORIDE

George I. Klein, Larchmont, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Continuation of Ser. No. 702,650, Feb. 2, 1968, abandoned. This application Nov. 9, 1970, Ser. No. 88,099

Int. Cl. C01b *25/10*

U.S. Cl. 423—300 8 Claims



1. A continuous process for producing phosphorus oxychloride, comprising the steps of:

a. providing liquid phosphorus trichloride in a first reaction zone;

b. introducing phosphorus and air into said first reaction zone to form phosphorus pentoxide in the presence of said phosphorus trichloride; and

c. passing the phosphorus pentoxide and phosphorus trichloride mixture from the first reaction zone to a second reaction zone, and reacting the mixture with chlorine fed into said second reaction zone to form phosphorus oxychloride.

3,927,180

METHOD OF CONVERTING BRUSHITE TO MONETITE CRYSTALS WITH CONTROLLED VARIATION IN CRYSTAL HABIT

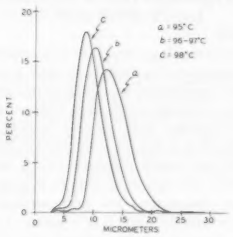
Charles F. Chenot, Towanda, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 313,356, Dec. 8, 1972, abandoned. This application Nov. 29, 1974, Ser. No. 528,140

Filed Nov. 29, 1974, Ser. No. 528,140

Int. Cl.[2] C01B *25/32*; B01D *9/02*

U.S. Cl. 423—308 4 Claims



1. A method of converting brushite to monetite crystals of substantially a single crystal habit, said method including isothermal and iso-pH control and consisting of the steps of: forming a brushite slurry containing about 10% solids by weight and having a first pH adjusted to about 4.5; placing said slurry in a container having stirring provision; adjusting said slurry to a second pH of about 9; heating said slurry to a final temperature of substantially 85°C while adjusting and maintaining said slurry at a third pH of 5.5 ± 0.2 and maintaining said pH and said temperature for 2 to 3 minutes with continuous stirring; adjusting said slurry to a fourth pH of 3.0 ± 0.1; digesting said slurry for about 20 minutes with gentle stirring to form a precipitate of said substantially single crystal habit, said single crystal habit being rhombohedral (diamond) monetite crystal having a basal plane acute angle of approximately 83°.

3,927,181

PROCESS FOR PREPARING HOLLOW BALLS OF SILICON CARBIDE AND PRODUCT FORMED THEREBY

Itaru Niimi, Nagoya; Yasuhisa Kaneko, Toyota; Fumiyoshi Noda, Toyota, and Yoshihiro Tsuzuki, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 26, 1973, Ser. No. 373,876

Claims priority, application Japan, July 6, 1972, 47-067784

Int. Cl.[2] C01B *31/36*

U.S. Cl. 423—345 11 Claims

6. A process for preparing hollow balls of silicon carbide which comprises the step of covering hollow balls of carbon with particles of a material selected from the group consisting of silicon and a slurry comprising metallic silicon, an aqueous sodium alginate solution, and an acrylic acid polymer, and then heating the covered balls in a non-oxidizing atmosphere at a temperature between 1100°C and 1200°C for a time

sufficient to form silicon carbide balls from said silicon and carbon.

9. Hollow balls of silicon carbide obtained by covering hollow balls of carbon with a material cosisting essentially of silicon and then heating the covered bodies in a non-oxidizing atmosphere at a temperature between 1100°C and 1200°C for a time sufficient to form silicon carbide balls from said silicon and carbon.

11. Hollow balls of silicon carbide obtained by covering hollow balls of carbon with a slurry comprising metallic silicon, a solution of an acrylic acid polymer and an aqueous sodium alginate solution, and then heating the covered balls in a non-oxidizing atmosphere at a temperature between 1100°C and 1200°C for a time sufficient to form silicon carbide balls from said silicon and carbide.

3,927,182
PROCESS FOR MAKING NITRIC ACID BY THE AMMONIA OXIDATION-NITRIC OXIDE OXIDATION-WATER ABSORPTION METHOD

James Basil Powell, 1410 Ellison Lane, Lakeland, Fla. 33801

Continuation-in-part of Ser. No. 118,676, Feb. 25, 1971, abandoned. This application June 14, 1973, Ser. No. 370,158

Int. Cl.² C01B *21/38*

U.S. Cl. 423—392 **9 Claims**

1. In a process for making nitric acid in an oxidation-absorption system by the ammonia oxidation-nitric oxide oxidation-water absorption procedure, in which ammonia is oxidized with an oxygen-containing gas to form nitric oxide, the nitric oxide is further oxidized with an oxygen-containing gas to form NO_2, and the NO_2 is absorbed in water to form a solution of nitric acid, and in which nitrogen oxides are discharged from the oxidation-absorption system in a purge gas stream from said water absorption, the improvement comprising charging to the ammonia oxidation reaction zone ammonia and as recycle at least about 40 volume percent of the unabsorbed gas exiting from said water absorption, said unabsorbed gas having a major amount of nitrogen and a minor amount of oxygen and nitrogen oxides, and charging make-up oxygen to the oxidation system as a molecular oxygen-containing gas having a molecular oxygen content of more than about 30 percent by volume to provide a total amount of molecular oxygen in the oxidation system of up to about 20 volume percent in excess of the stoichiometric amount required for complete oxidation of the ammonia to nitrogen peroxide and form nitric acid, said chargings of ammonia, recycle unabsorbed gas and make-up, oxygen-containing gas being such to maintain the concentration of ammonia below the explosive limit, and purging from the oxidation-absorption system a minor portion of the unabsorbed gas from said water absorption containing a major amount of nitrogen and a minor amount of oxygen and nitrogen oxides, said purging being in an amount sufficient to prevent nitrogen build-up in the oxidation-absorption system.

3,927,183
METHOD FOR OXIDIZING NITROGEN OXIDES

Takashi Oushiba, Tokyo, Japan, assignor to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 185,513, Oct. 1, 1971, abandoned, which is a division of Ser. No. 819,514, April 23, 1969, Pat. No. 3,661,512. This application Apr. 6, 1973, Ser. No. 348,608

Claims priority, application Japan, July 4, 1968, 43-46213; May 6, 1968, 43-29819; Apr. 26, 1968, 43-27696

Int. Cl.² C01B *21/36, 21/40*

U.S. Cl. 423—393 **8 Claims**

1. A process for the production of nitric acid having a concentration of over 68% comprising passing a contact medium through a first zone by introducing the contact medium at the top of the first zone, bubbling nitrogen oxides and oxygen through said contact medium by introducing said nitrogen oxides and said oxygen at the bottom of the first zone, said nitrogen oxides being selected from the group consisting of nitrogen monoxide, dinitrogen trioxide and nitrogen peroxide, maintaining the first zone at a temperature between ambient temperature and about 60°C and at a pressure between ambient pressure and about 15 kg/cm², said contact medium comprising nitric acid, potassium nitrate and water, said nitric acid having a concentration less than the concentration of nitric acid produced in the process, said potassium nitrate being present in at least 10% by weight, said water being present in an amount sufficient to completely convert, together with the oxygen, the nitrogen oxides to nitric acid, withdrawing the contact medium from the first zone and feeding the contact medium now containing a more concentrated nitric acid to a second zone, heating the contact medium in the second zone to about 80°C to liberate NO_2 gas, transferring the contact medium to a third zone and vaporizing nitric acid to obtain said acid having a concentration of over 68%.

5. A method for the oxidation of nitrogen oxide comprising passing a contact medium through a first zone by introducing the contact medium at the top of the first zone, bubbling nitrogen oxides and oxygen through the contact medium by introducing the nitrogen oxides and oxygen at the bottom of the first zone, said nitrogen oxides being selected from the group consisting of nitrogen monoxide and dinitrogen trioxide, maintaining the first zone at a temperature between ambient temperature and about 60°C and at a pressure between ambient pressure and about 15 kg/cm² so that the contact medium absorbs the nitrogenoxides and oxygen, said contact medium comprising nitric acid and potassium nitrate, said potassium nitrate being present in at least 10 percent by weight, withdrawing the contact medium now enriched by oxidized nitrogen oxides from the first zone and feeding the now enriched medium to a second zone, and heating the enriched contact medium in the second zone to about 80°C to liberate the oxidized nitrogen oxides gas.

3,927,184
PROCESS FOR PRODUCING HYDROXY-ALUMINUM NITRATE POLYMER

Clive Hodgson, Forest Knolls, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 8, 1974, Ser. No. 458,632

Int. Cl.² C01B *21/40*

U.S. Cl. 423—394 **8 Claims**

1. A process for producing hydroxy-aluminum nitrate having an aluminum to hydroxyl ratio of from 1:1 to 1:2.6 by reacting aluminum nitrate and powdered aluminum metal, wherein the molar ratio of aluminum nitrate to aluminum varies from about 1:0.1 to 1:1.85, in an aqueous reaction medium of about 1 mol to 1000 mols water per mol of aluminum nitrate, at a temperature of 50° to 150°C.

3,927,185
PROCESS FOR PRODUCING CARBON DISULFIDE

Morton Meadow, Trenton, and Sidney Berkowitz, Highland Park, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Apr. 30, 1973, Ser. No. 355,991

Int. Cl.² C01B *33/06*

U.S. Cl. 423—443 **26 Claims**

1. Continuous process for producing carbon bisulfide by reaction of sulfur and hydrocarbon gas containing a multi-carbon hydrocarbon having at least 3 carbon atoms which comprises continuously feeding, into a reaction zone having solid walls, a stream of sulfur vapor having a temperature of at least 650°C and a stream of said gas, to mix therewith in said zone, the temperatures and rates of flow of said vapor and gas being such that the calculated mixing temperature thereof is in the range of about 585° to 700°C., and the flow conditions and mixing conditions of said gas and vapor streams being such that said gas becomes substantially completely mixed with said vapor before said gas comes into contact with a wall of said

zone, and thereby effecting non-catalytic reaction between substantially all said multi-carbon hydrocarbon and sulfur prior to such contact, said reaction being effected at a pressure of at least 3.5 atmospheres.

3,927,186

METHOD FOR THE PREPARATION OF CARBON STRUCTURES

Clarence S. Vinton, and Charles H. Franklin, both of Ann Arbor, Mich., assignors to Chemotronics International, Inc., Ann Arbor, Mich.

Filed Feb. 28, 1973, Ser. No. 336,636

Int. Cl. C01b *31/07*

U.S. Cl. 423—447 **11 Claims**

3. The method of forming a vitreous carbon structure which comprises

a. infusing a reticulated flexible polyurethane structure formed of thin cross-section strands with a liquid thermosetting furan resin or resin precursor so as to cause th strands to swell by infusion of the liquid furan resin or resin precursor completely through the strands;

b. removing substantially all of the non-infused resin or resin precursor from the surfaces of the strands;

c. polymerizing the resin or resin precursor in the structure to form a polymerized, thermoset and hardened structure wherein the infusing, removing and polymerizing of the resin or resin precursor produces a resulting weight up to about six times the weight of the structure alone; and

d. heating the polymerized hardened pretreated structure under neural or reducing gas or vacuum conditions in an oven which rapidly heats the structure to a temperature of at least about 1000°C so as to form the vitreous carbon structure, whereby crack free carbonization is achieved in less than about 5 hours at a rate of temperature change of the structure which causes cracking of pretreated strands with non-infused thermoset resin coated on the surfaces.

3,927,187

METHOD OF MAKING SHAPED CARBONACEOUS BODIES

Hartmut Luhleich, Duren; Hubertus Nickel, and Francesco Dias, both of Julich, all of Germany, assignors to Kernforschungsanlage JULICH GmbH, Julich, Germany

Filed June 29, 1972, Ser. No. 267,479

Claims priority, application Germany, June 2, 1971, 2133044

Int. Cl. C01b *31/04*

U.S. Cl. 423—448 **1 Claim**

1. A method of making a graphitic body, comprising the steps of:

a. coating particles with a particle size of 50 to 100 microns of petroleum coke, electrically produced graphite, natural graphite or carbon black with a binder selected from the group which consists of pitch, tar or synthetic resin in a liquid mixture consisting of methanol as a solvent for said binder and water, thereby producing a slurry of binder-coated particles;

b. drying the slurry of binder-coated particles and comminuting the dried slurry to produce a powdered mass of binder-coated particles;

c. shaping said powder mass of binder-coated particles in a mold;

d. treating the mass in said mold with methanol vapor;

e. thereafter drying the shaped mass of binder-coated particles; and

f. cokefying the dried shaped mass.

3,927,188

ZIRCONIUM COMPLEXES OF BASIC ALUMINUM BROMIDES AND METHODS OF MAKING SAME

John L. Jones, North Plainfield; Andrew M. Rubino, New Providence, both of N.J., and Charles B. Lindahl, Sand Springs, Okla., assignors to Armour Pharmaceutical Company, Chicago, Ill.

Filed July 20, 1971, Ser. No. 164,433

Int. Cl.² C01G *25/04;* **C01F** *7/00, 7/48*

U.S. Cl. 423—463 **7 Claims**

1. A method of preparing alcohol soluble solid complexes of 5/6 basic aluminum bromides comprising the steps of providing an aqueous solution of 5/6 basic aluminum bromide having the general empirical formula:

$$Al_2(OH)_{6-x}Br_x$$

in which x equals about 0.9 to 1.2; adding to said aqueous solution a substance selected from the group consisting of zirconyl hydroxychloride, zirconyl hydroxybromide, a combination of zirconyl hydroxychloride and zirconyl hydroxybromide, and a combination of any of the above zirconyl hydroxyhalides with zirconyl chloride and/or zirconyl bromide; said substance being added in an amount sufficient to yield an Al/Zr mole ratio of about 3:1 to 20:1; and drying the resulting mixture to a substantially friable solid.

3,927,189

METHOD FOR MAKING PEROXYDISULFURIC ACID AND SALTS THEREOF

Madhusudan D. Jayawant, Hockessin, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Apr. 12, 1974, Ser. No. 460,610

Int. Cl.² C01B *15/06, 15/08*

U.S. Cl. 423—513 **7 Claims**

1. A method for making peroxydisulfuric acid comprising the steps

a. forming a dispersion of sulfur trioxide and active oxygen precursors selected from the group consisting of hydrogen peroxide, peroxymonosulfuric acid and mixtures thereof in which the ratio by weight of the sulfur trioxide to the sum of the weight of the active oxygen precursors and any water present corresponds to from about $X - 0.015A - 0.0046B$ to about 1.5X, wherein X is defined by the relationship $(0.00264A - 0.03741B + 4.4434)$, wherein A is the % by weight hydrogen peroxide B is the % by weight peroxymonosulfuric acid, the basis of the above relationships being predicated upon the sum of the weight of the active oxygen precursors and any water which is present; and (b) maintaining the dispersion in the liquid phase at a temperature no higher than about 45°C until the active oxygen distribution of the final reactant mixture therefrom is less than about 67 mole % active oxygen precursors and more than about 33 mole % peroxydisulfuric acid.

3,927,190

METHOD FOR PRODUCING ANHYDROUS HYDROSULFITE

Yoshio Yoshikawa, Ushiku; Akitoshi Sugio; Tomotake Kato, both of Tokyo, and Heizo Okazaki, Osaka, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 429,685, Dec. 28, 1973, abandoned, which is a continuation of Ser. No. 201,319, Nov. 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 637,062, May 9, 1967, abandoned. This application July 12, 1974, Ser. No. 487,573

Claims priority, application Japan, May 16, 1966, 41-30689; May 16, 1966, 41-30690; Nov. 17, 1966, 41-75237

Int. Cl.² C01B *17/66*

U.S. Cl. 423—515 **2 Claims**

1. A method of producing an anhydrous alkali metal hydrosulfite from an alkali metal formate, and alkali metal compound and sulfur dioxide, which comprises:

a. adding an aqueous solution of an alkali metal compound and a methanolic solution of sulfur dioxide to an alcohol-water solution or suspension of an alkali metal formate, said alcohol being selected from the group consisting of methanol and ethanol, said addition carried out at a temperature of at least about 75°C; and

b. thereafter maintaining the temperature of the reaction mixture up to about 80° to 90°C to foster the reaction, wherein the pressure of the reaction system is superatmospheric up to about 10 kilograms per square centimeter gauge.

3,927,191
PROCESS FOR RECOVERY OF SULPHUR FROM SULPHUR DIOXIDE

Jacques Olivier Archambault, and John Douglas McIrvine, both of Mont-Saint-Hilaire, Canada, assignors to Canadian Industries Limited, Montreal, Canada

Filed Jan. 21, 1971, Ser. No. 108,281
Claims priority, application Canada, Feb. 11, 1970, 074603
Int. Cl.² C01B *17/04*
U.S. Cl. 423—570 **4 Claims**

1. In a process for the reduction of sulphur dioxide with hydrocarbon gas in molar ratio of sulphur dioxide to hydrocarbon calculated as methane of 2:1 employing three reaction stages in the presence of catalyst, wherein during the first stage, at 800°C. to 1000°C., sulphur dioxide is reduced to hydrogen sulphide, carbonyl sulphide and carbon disulphide; in the second stage, at 350°C. to 450°C. and in the presence of a catalyst, sulphur dioxide reacts with the carbonyl sulphide and carbon disulphide to form elemental sulphur; and in the third stage, at 200°C. to 275°C. and in the presence of a catalyst, sulphur dioxide and hydrogen sulphide in 1:2 molar ratio react to form additional elemental sulphur, the improvement which comprises introducing the sulphur dioxide in two separate portions of which the first portion in amount sufficient to provide a mole ratio of sulphur dioxide to hydrocarbon calculated as methane in the range 1.0 to 1.2 is introduced in the first reaction stage, and the second portion in amount sufficient with addition of the first portion to provide a total mole ratio of sulphur dioxide to hydrocarbon calculated as methane of 2.0 is introduced in the second reaction stage.

3,927,192
CHEMICAL CYCLE FOR THERMOCHEMICAL PRODUCTION OF HYDROGEN FROM WATER

Carlos E. Bamberger, and Donald M. Richardson, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 29, 1975, Ser. No. 545,042
Int. Cl.² C01B *1/02*
U.S. Cl. 423—648 **4 Claims**

1. A substantially closed thermochemical process for decomposing water, comprising the steps of:

reacting chromic oxide with an alkali metal hydroxide selected from the group consisting of potassium hydroxide, rubidium hydroxide, and cesium hydroxide to produce alkali metal hypochromate, water and hydrogen as reaction products;

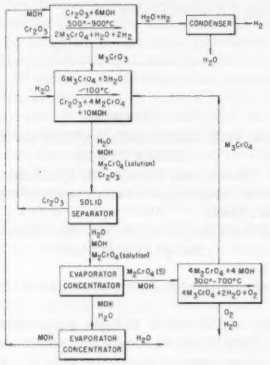
separating said hydrogen as a product;

reacting said alkali metal hypochromate with water to produce chromic oxide, alkali metal chromate and alkali metal hydroxide as reaction products;

reusing said chromic oxide and a portion of said alkali metal hydroxide products from said second mentioned step of reacting in said first mentioned step of reacting;

reacting said alkali metal chromate and the remaining portion of said alkali metal hydroxide from said second mentioned step of reacting to produce alkali metal hypochromate, water, and oxygen as reaction products;

separating said oxygen as a product; and



reusing said alkali metal hypochromate from said third mentioned step of reacting in said second mentioned step of reacting.

3,927,193
LOCALIZATION OF TUMORS BY RADIOLABELLED ANTIBODIES

Hans John Hansen, Allendale, and Frederick James Primus, Waldwick, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

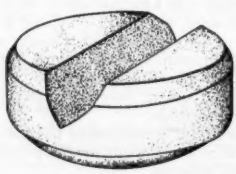
Filed May 18, 1973, Ser. No. 361,718
Int. Cl.² A61K *43/00*; G01T *1/161*
U.S. Cl. 424—1 **3 Claims**

1. A method for determining the location of a tumor which either produces or is associated with carcinoembryonic antigen which comprises injecting a subject parenterally with an antibody radiolabelled with a pharmacologically inert radioisotope having a half-life up to about 8 days and a gamma emission of 10 to 5000 Kev said antibody being specific to carcinoembryonic antigen and subsequently scanning the subject with a photoscanning device to determine the location of the resulting uptake of radiolabelled antibody by said tumor.

3,927,194
TABLET FORMULATION

Ehud Geller, King of Prussia, Pa., assignor to Ives Laboratories Inc., New York, N.Y.

Division of Ser. No. 312,469, Dec. 6, 1972, Pat. No. 3,883,647.
This application Dec. 4, 1974, Ser. No. 529,423
Int. Cl.² A61J *3/10*; A61K *9/00*
U.S. Cl. 424—15 **9 Claims**



1. A chewable pharmaceutical tablet which is adequately imprinted with indicia or embossing and scored to form a groove which is ⅓ to ⅔ the depth of the total tablet thickness to facilitate separation into subdivisions containing substantially equal amounts of pharmaceutically active ingredient

comprising a directly compressed formulation of:

A. Active ingredient	5 to 10 milligrams
B. Microcrystalline Cellulose	20 to 25 percent by weight
C. Dextrose and corn syrup solids granulation	30 to 55 percent by weight
D. Mannitol	20 to 30 percent by weight
E. Magnesium stearate	0.9 to 1.0 percent by weight
F. The remainder being pharmaceutically acceptable fillers, extenders, flavoring and the like.	

3,927,195

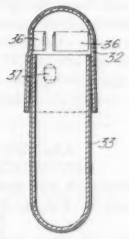
PRODUCTION OF CAPSULES

Edoardo Messora, Rome, Italy, assignor to Lilly Industries Limited, London, England

Filed Jan. 31, 1974, Ser. No. 438,490

Int. Cl.² A61K *9/48*

U.S. Cl. 424—21 **5 Claims**



1. An empty and reclosable two-piece capsule comprising, assembled together, unsealed, a body having a closed end wall and a side wall having a generally cylindrical open end portion, and a cap having a closed-end wall and a generally cylindrically side wall closely telescopically received in conforming gripping engagement over the open end of the body, said body and cap being free from conforming gripping engagement lands or circumferential seals or bands at the junction of the cap and body composed of two layers, the material constituting the inner of the two layers being gelatin and the outer of the two layers being a material which is only soluble at a pH greater than 3.5.

3,927,196

SOLUBLE CAPSULES

Marvin Hersh, Strafford, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 159,568, July 2, 1971, abandoned. This application Mar. 7, 1974, Ser. No. 449,142

Int. Cl.² A61J *3/07*; **A61K** *9/48*

U.S. Cl. 424—37 **6 Claims**

1. A unit dosage form comprising a two-piece, hard-walled, telescopically joined soluble gelatin capsule containing a powdered solid which comprises a conventional solid encapsulating lubricant composition consisting essentially of micropellets of finely divided particles of solid hydrophobic encapsulating lubricant selected from the group consisting of magnesium stearate, calcium stearate, stearic acid, talcum, and powdered vegetable stearine, a substantial proportion of the particles of said lubricant being enrobed in a hydrophilic friable sheath, said sheathing material being selected from the group consisting of mannitol, polyethylene glycol 4000, 6000, and 20,000, gelatin, methyl cellulose, carboxymethylcellulose, gum arabic, and polyvinyl alcohol; said enrobed encapsulating lubricant imparting a reduction in dissolution time to said dosage form when incorporated in said dosage form, as compared to said lubricant when not enrobed.

3,927,197

TERTIARY ALCOHOL STABILIZED E-SERIES PROSTAGLANDINS

Donald C. Monkhouse, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

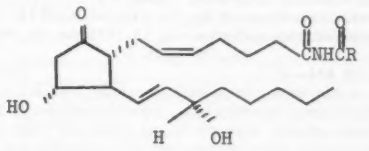
Filed Apr. 19, 1974, Ser. No. 462,213

Int. Cl.² A61K *9/12, 31/19*; **C07C** *19/74, 103/37*

U.S. Cl. 424—45 **8 Claims**

1. A stabilized pharmaceutical composition comprising a biologically active prostaglandin of the E-series and a saturated aliphatic tertiary alcohol having from 4 to 10 carbon atoms, said prostaglandin being present in the amount of from about 0.005 to 0.500% by weight.

4. The composition of claim 1 wherein said prostaglandin is a PGE_2 carboxamide of the formula:



wherein R is methyl or phenyl.

8. The composition of claim 1 also containing from about 1 to 10 parts by volume, based on said alcohol, of a halogenated hydrocarbon propellant of up to 2 carbon atoms.

3,927,198

METHYLOLATED 5,5-DIALKYLHYDANTOIN FILM FORMING SYNTHETIC RESIN AS A HAIR FIXATIVE

Hans-Albrecht Meyer-Stoll, Rheinkamp; Johannes Wollner, Kapellen Kreis, Moers, and Hans-Heinz Schittek, Rheinkamp, all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Division of Ser. No. 827,984, May 26, 1969, abandoned. This application Dec. 28, 1970, Ser. No. 102,161

Claims priority, application Germany, May 29, 1968, 1770518

Int. Cl.² A61K *7/11*

U.S. Cl. 424—47 **8 Claims**

1. A hair fixative composition containing from 1 to about 10% by weight of a film-forming synthetic resin and a solvent for said resin, said film-forming synthetic resin having a molecular weight in the range of from about 700 up to about 3,000 and being obtained by reacting at an elevated temperature in the range of about 70°C. to about 115°C., a methylolated, 5,5-dialkylhydantoin wherein each alkyl group thereof contains from 1 to 5 carbon atoms, in the presence of a reactant member selected from the group consisting of

a. from about 0.2 to about 2.5 moles of urea per mole of said hydantoin and from about 0.2 to about 1.0 mole of a low molecular weight ketone per mole of urea;
b. from about 0.2 to about 2.5 moles of salicylic acid amide per mole of said hydantoin;
c. from about 0.2 to about 2.5 moles of a mixture of urea and a diamine per mole of said hydantoin;
d. from about 0.2 to about 1 mole of a diamine per mole of said hydantoin;
e. from about 0.2 to about 2.5 moles of urea per mole of said hydantoin, from about 0.2 to about 1.0 mole of a low molecular weight ketone per mole of urea, and from about 0.2 to about 1 mole of a diamine per mole of said hydantoin; and
f. from about 0.2 to about 2.5 moles of salicyclic acid amide per mole of said hydantoin, and from about 0.2 to about 1 mole of a diamine per mole of said hydantoin.

8. A hair fixative composition in an aerosol spray can, said composition consisting essentially of an admixture of from about 3 to 6% by weight of the film-forming synthetic resin of claim 1 in a latent solvent selected from the group consisting of an anhydrous alcohol, a halogenated hydrocarbon and a mixture of said anhydrous alcohol and halogenated hydrocarbon, and as the propellant an admixture of fluorochlorinated hydrocarbons.

3,927,199

HAIR FIXING COMPOSITIONS CONTAINING N-ALKYL ACRYLAMIDE OR METHACRYLAMIDE INTERPOLYMER

Albert L. Micchelli, Middletown; Gerard J. Legato, Stirling; Stuart H. Ganslaw, Piscataway, and Lawrence D. Schuler, North Brunswick, all of N.J., assignors to National Starch and Chemical Corporation, Clifton, N.J.

Continuation-in-part of Ser. No. 244,264, April 14, 1972, abandoned. This application Aug. 13, 1973, Ser. No. 388,325

Int. Cl.[2] A61K 7/11

U.S. Cl. 424—47 10 Claims

1. A hair fixing composition containing a solvent selected from the group consisting of 1,1,1-trichloroethane, methylene chloride, ethanol, isopropanol, and water, and from 0.25 to 7%, by weight, of an interpolymer of (1) 30–60% of a comonomer selected from the group consisting of N-alkyl acrylamide and N-alkyl methacrylamide wherein the alkyl group thereof contains from 2 to 12 carbon atoms, (2) 12–18% of an acidic copolymerizable comonomer selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid, itaconic acid, maleic acid, fumaric acid, and the (C_1–C_4) alkyl half esters of maleic and fumaric acids, and (3) 20–55% of at lest one copolymerizable comonomer selected from the group consisting of (C_1–C_{12}) alkyl acrylates, (C_1–C_{12}) alkyl methacrylates, (C_2–C_4) hydroxyalkyl acrylates, hydroxystearyl acrylate, hydroxyalkyl methacrylates, hydroxystearyl methacrylate, (C_1–C_4) alkyl (C_2–C_4) amino alkyl acrylates, (C_1–C_4) alkyl (C_2–C_4) aminoalkyl methacrylates, vinyl acetate, vinyl propionate, diacetone acrylamide, styrene, and alpha-methyl styrene; said interpolymer being sufficiently neutralized with an alkaline reagent to effect its solubility in water.

5. The hair fixing composition of claim 1, wherein the composition is in an aerosol container and also contains an aerosol propellant therefor.

3,927,200

STABILIZATION OF MICROORGANISM CELLS LYTIC ENZYME

Yoshio Yoshimura, Nishinomiya; Kanae Yokogawa, Nara, and Shigeo Kawata, Kobe, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Filed Apr. 20, 1973, Ser. No. 353,570

Claims priority, application Japan, Apr. 22, 1972, 47-40805

Int. Cl.[2] A61K 7/28; C12D 13/10

U.S. Cl. 424—50 9 Claims

9. A stable composition for preventing and treating dental caries comprising as an essential active ingredient an enzyme which is capable of lysing cells of cariogenic streptococci which is obtained by cultivating a microorganism selected from the group consisting of *Streptomyces diastatochromogenes* (ATCC No. 21481), *Streptomyces farinosus* (ATCC No. 21482), *Streptomyces griseus var. H*-402 (ATCC No. 21483) and *Streptomyces globisporus* (ATCC No. 21533) and as a stabilizer at least one of stabilizers selected from the group consisting of carboxymethyl cellulose or its sodium salt, glycerin and monoethanolamine in admixture with a carrier selected from water, toothpaste, tooth powder or ointment.

3,927,201

DENTIFRICES

Eric Baines, Manchester; Edwin Cropper, Shaw, and Sydney James Forshaw, Manchester, all of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 23, 1974, Ser. No. 435,898

Claims priority, application United Kingdom, Jan. 29, 1973, 4335/73

Int. Cl.[2] A61K 7/16

U.S. Cl. 424—54 11 Claims

1. A visually clear dentifrice comprising about 5 to 50% by weight of a dentally acceptable water-soluble sodium phosphate salt polishing agent having a refractive index between about 1.435 and about 1.465, a water-soluble biguanidohexane antimicrobial agent in amount to provide about 0.001–5% by weight of the free base thereof and a dentifrice gel vehicle comprising (1) about 20% up to about 80% by weight of said dentifrice of a liquid phase including humectant having a refractive index of about 1.44 to 1.47, said humectant consisting essentially of a member selected from the group consisting of sorbitol, glycerine and mixtures thereof and 0 up to an amount of said visually clear dentifrice of free water in which not more than about 30% by weight of said polishing agent is soluble at 40°C., and (2) about 0.5 to 20% by weight of a gelling agent selected from the group consisting of sodium carboxymethyl cellulose, Irish moss and hydroxyethyl cellulose, the refractive index of said dentifrice gel vehicle being between about 1.36 and about 1.47, said polishing agent and said antibacterial agent being homogeneously and invisibly distributed in said visually clear dentifrice gel vehicle.

3,927,202

DENTIFRICES

Kenneth Harvey, Prestwich, and Sydney Lee, Worsley, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 23, 1974, Ser. No. 435,899

Claims priority, application United Kingdom, Jan. 29, 1973, 4338/73

Int. Cl.[2] A61K 7/16

U.S. Cl. 424—57 8 Claims

1. A visually clear dentifrice comprising about 5 to 50% by weight of a dentally acceptable water-soluble sodium phosphate salt polishing agent having a refractive index between about 1.435 and about 1.465 and a dentifrice gel vehicle comprising (1) about 20% up to about 80% by weight of said dentifrice of a liquid phase including humectant having a refractive index of about 1.44 to 1.47 said humectant consisting essentially of a member selected from the group consisting of sorbitol, glycerine and mixtures thereof and O up to amount of free water in which not more than about 30% by weight of said polishing agent is soluble at 40°C and (2) about 0.5–10% by weight of a gelling agent, the refractive index of said visually clear dentifrice gel vehicle being between about 1.36 and 1.47, said phosphate salt being homogeneously and invisibly distributed in said dentifrice gel vehicle.

3,927,203

COSMETIC COMPOSITIONS EMPLOYING CERTAIN COMPOLYMERS

Donald Edwin Seymour, London; Nicholas Mario da Costa, Harlow, and William Thomas Charville, Ware, all of England, assignors to Hydron Limited, London, England

Continuation-in-part of Ser. No. 867,378, Oct. 17, 1969, abandoned. This application Oct. 26, 1973, Ser. No. 409,821

Claims priority, application United Kingdom, Oct. 22, 1968, 50043/68; Dec. 20, 1968, 60755/68

Int. Cl.[2] A61K 7/04, 7/021, 31/78

U.S. Cl. 424—61 16 Claims

1. A film-forming composition for application to the nail or epidermis of a human being as a nail varnish, a wound dressing or a cosmetic preparation, which comprises (i) a copolymer obtainable by copolymerizing a reaction mixture comprising

from 80 to 20 parts by volume of ethoxy ethyl methacrylate with from 20 to 80 parts by volume of methoxy ethyl methacrylate, said copolymer contained in said composition being present in an amount sufficient to form a film on the epidermis of said human being, and (ii) a suitable carrier.

3,927,204
USE OF α,β-POLY-(ASPARTIC ACID)-HYDROXYALKYLAMIDES AS A PLASMA EXPANDER

Paolo Neri; Guido Antoni, and Franco Benvenuti, all of Siena, Italy, assignors to Instituto Sieroterapico e Vaccinogeno Toscano "Sclavo" S.p.A., Siena, Italy

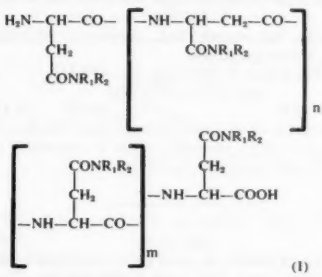
Continuation-in-part of Ser. No. 51,771, July 2, 1970. This application Aug. 21, 1974, Ser. No. 499,580

Claims priority, application Italy, July 3, 1969, 4667/69

Int. Cl.² A61K *31/74, 35/14, 37/00*

U.S. Cl. 424—78 **5 Claims**

1. A method for the treatment of a patient with a diminished plasma volume level and microcirculatory impairment due to septic or traumatic shock, said method comprising intravenously administrating to the patient a therapeutically effective plasma expanding dose of a compound of a hydroxyalkylamide of α,β-polyaspartic acid having the formula



(I)

wherein: R_1 is hydrogen, an alkyl group, or a hydroxyalkyl group; R_2 is a hydroxyalkyl group; n is the number of beta-linked residues; m is the number of alpha-linked residues, and the sum of $n + m$ is within the range of 100 to 300 (calculated from viscosity measurements in DMF according to Doty's curve, J. Am. Chem. Soc. 78, 947, 1956) or from 75 to 550 (calculated from ultracentrifuge measurements).

3,927,205
AQUEOUS SUSPENSION OF PHARMACEUTICALS

Yoshitomo Ohno, Nara; Yasuko Takigawa; Katsuo Aoki, both of Osaka, and Takatsuka Yashiki, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 9, 1974, Ser. No. 459,359

Claims priority, application Japan, Apr. 9, 1973, 48-40264

Int. Cl.² A61K *31/79, 47/00*

U.S. Cl. 424—80 **15 Claims**

1. In an aqueous suspension containing up to 8 percent by weight per volume of a pharmaceutically active ingredient(s) which is insoluble or sparingly soluble in water having an average size particle size smaller than about 100 μ and a suspending agent, the improvement, wherein the suspending agent consists essentially of

1. Crystalline cellulose
2. at least one component selected from the group consisting of methyl cellulose, sodium carboxymethyl cellulose and polyvinyl alcohol having a molecular weight of 8,000 to 180,000; and
3. at least one component selected from the group consisting of polyvinyl pyrrolidone having a molecular weight of 10,000 to 3000,000, propylene glycol alginate, sodium pectinate, tragacanth gum and gelatin, the amount of component (1) being 0.3 to 5 weight/volume percent of the aqueous suspension, the amount of component (2) plus the component (3) being 0.1 to 4 weight/volume percent of the aqueous suspension and wherein the weight ratio of component (2) relative to component (3) being in the range of from 15/85 to 80/20.

3,927,206
COPOLYMER CONTAINING MEDICAMENTS

Izhak Blank, and Joseph Fertig, both of Haifa, Israel, assignors to Hydrophilics International, Inc., New York, N.Y.

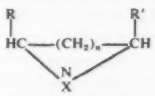
Continuation-in-part of Ser. No. 246,831, April 24, 1972. This application July 12, 1974, Ser. No. 487,871

Claims priority, application United Kingdom, Aug. 12, 1971, 37936/71

Int. Cl.² A61K *31/78*

U.S. Cl. 424—81 **3 Claims**

1. A pharmaceutical composition having slow release properties containing a copolymer comprising from 10 to 30 parts, by volume, of a member selected from the class consisting of acrylic and methacrylic acid and from 50 to 90 parts, by volume, of a member selected from the class consisting of alkyl acrylates and methacrylates, wherein the alkyl group has from 1 to 4 carbon atoms, the acid groups of said copolymer having been neutralized with an alkylene imine having the formula:



where R and R′ are each selected from the class consisting of hydrogen and lower alkyl radicals, X is hydrogen or hydroxyl, and n is a number from 0 to 4; said copolymer having absorbed or adsorbed therein a small, but effective amount of a watersoluble medicinal agent.

3,927,207
METHOD FOR COMBATING INSECTS EMPLOYING CERTAIN KETONES

Wittko Francke, Reinbek, and Volker Heemann, Hamburg, both of Germany, assignors to Amchem Products, Inc., Ambler, Pa.

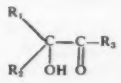
Filed Nov. 6, 1973, Ser. No. 413,386

Claims priority, application Germany, Nov. 9, 1972, 2254697

Int. Cl.² A01N *17/14*

U.S. Cl. 424—84 **19 Claims**

1. A method of attracting beetles of the families *scolytidae* and *platypodidae* within the order *coleoptera* comprising applying to an area contaminated with said beetles an attractant having the formula



where R_1 is alkyl of 1 to 6 carbon atoms, R_2 is alkyl of 1 to 6 carbon atoms and R_3 is alkyl of 1 to 6 carbon atoms, said attractant being applied to said area in an amount sufficient to attract said beetles.

3,927,208

LIVE BOVINE ADENOVIRUS VACCINES, PREPARATION THEREOF AND METHOD OF VACCINATION USING THEM

Nathan Zygraich, Brussels, and Constant Huygelen, Huldenberg, both of Belgium, assignors to Recherche et Industrie Therapeutiques (R.I.T.), Belgium

Continuation-in-part of Ser. No. 360,219, May 14, 1973, abandoned. This application Jan. 31, 1974, Ser. No. 438,503

Int. Cl.[2] A61K *39/12*

U.S. Cl. 424—89 6 Claims

1. A live virus bovine adenovirus intranasal vaccine protective against bovine adenovirus type 3 infection comprising an effective intranasal dose of a temperature-sensitive nitrous acid mutant of the pathogenic bovine adenovirus, said mutant having a cut-off temperature of from about 39° to 40°C and being abie to multiply in the upper respiratory tract of a bovine animal but having inhibited replication in the lower respiratory tract and internal organs of the body, and a pharmaceutical intranasal diluent.

3,927,209

PARA-INFLUENZA-3-VIRUS

Otto Christian Straub, Teubingen, Germany, assignor to Bayer Aktiengesellschaft, Germany

Filed May 6, 1974, Ser. No. 467,479

Claims priority, application Germany, May 11, 1973, 2323847

Int. Cl.[2] A61K *39/12*, *39/34*

U.S. Cl. 424—89 7 Claims

1. A vaccine which comprises an amount of para-influenza-3-virus strain ATCC VR-739 sufficient to be effective against para-influenza-3-virus in combination with a diluent or carrier suitable for vaccination of bovines.

3,927,210

ANTIBIOTIC ENSANCHOMYCIN

Edward O. Stapley, Metuchen, N.J., and Justo Martinez Mata, Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 415,185, Nov. 12, 1973. This application June 7, 1974, Ser. No. 477,251

Int. Cl. H61k *21/00*

U.S. Cl. 424—118 4 Claims

2. A method of treating bacterial infections in animals which comprises the administration to said animal of an antibacterially effective amount of the antibiotic Ensanchomycin, said antibiotic being characterized by the following properties: an ultraviolet absorption peak at 247 mμ in an acid solution and an ultraviolet absorption peak at 258 mμ in a basic solution having an infrared spectrum in a Nujol mull as shown in FiG. 1, and an elemental analysis of its ammonium salt as follows: C = 47.11 percent; H = 6.90 percent; N = 7.67 percent; phosphorus = 1.93 percent; and O = 36.39 percent (by difference) with the said ammonium salt having an approximate empirical formula of: $C_{63}H_{116}N_9O_{36}P$ and a measured equivalent weight of 1477, and a pK_a of 4.6, or its pharmaceutically acceptable salts.

3,927,211

ANTIBIOTIC MYC 8003 AND PROCESS FOR PRODUCING SAME

Cornelis Vos, Pijnacker, and Jacobus Den Admirant, Delft, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Continuation-in-part of Ser. No. 170,516, Aug. 10, 1971, abandoned. This application Mar. 26, 1973, Ser. No. 344,610

Claims priority, application United Kingdom, Aug. 14, 1970, 39367/70

Int. Cl. A61k *21/00*

U.S. Cl. 424—122 3 Claims

1. A member of the group consisting of the antibiotic MYC 8003, which is a yellow, salt-forming weak acid solid having the analysis: carbon, 63.8%; hydrogen, 7.6%; nitrogen, 3.5%; and oxygen, 25.1%; consisting of equilibrium-forming components, with an optical rotation $[\alpha]_D^{22}$ of −60° (1% methanolic solution), poorly soluble in carbon tetrachloride and benzene, soluble in chloroform, methyl isobutyl ketone, butyl acetate, ethyl acetate, methanol and alkaline solutions, insoluble in diethyl ether, petroleum ether, water and acid solutions, showing a slightly positive reaction in the aromate test, forming a red color with concentrated sulfuric acid, a dark brown color in the Pauly reaction, a dark red color and turbidity with ferric chloride, and precipitation with bromine water, showing gas production at 135°C, showing further gas production at about 152°C and showing a decomposition at 164°–174°C, showing in the ultraviolet region of the spectrum absorption maxima at 233, 276, 286, and 327 nm as in FIG. 1, and in the infrared region, in KBr, absorption bands at 812, about 860, 940, 985, 1092, 1215, 1340–1380, 1460, 1540, 1640, 2933, 2969 and about 3370 cm^{-1} as in FIG. 3 and an Rf-value of 0.10 of the chief component, when chromatographed with a mixture of benzene, ethanol and 33% ammonia in the ratio of 65:40:9 and having the PMR spectrum of FIG. 4, and its non-toxic, pharmaceutically acceptable salts.

3,927,212

METHOD FOR ALLEVIATING GASTRIC MUCOSAL BLEEDING

Tsung-Min Lin, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed June 7, 1974, Ser. No. 477,213

Int. Cl.[2] A61K *37/00*

U.S. Cl. 424—177 6 Claims

1. A method for alleviating gastric mucosal bleeding which comprises parenterally administering to a mammal a therapeutically effective amount of glucagon.

3,927,213

PROSTAGLANDIN E_2 AND DERIVATIVES FOR REDUCING THE SIDE EFFECTS OF ANTI-INFLAMMATORY AGENTS

Wilbur Lippmann, Montreal, Canada, assignor to American Home Products Corporation, New York, N.Y.

Filed July 10, 1973, Ser. No. 378,113

Int. Cl.[2] A61K *31/19*, *31/40*, *31/415*, *31/61*

U.S. Cl. 424—234 8 Claims

1. A method of reducing the incidence of gastrointestinal side effects in a mammal during the treatment of inflammatory conditions with an antiinflammatory agent, which comprises administering to said mammal a gastrointestinal side effect inhibiting amount within the range of about 0.01 microgram to about 1 milligram per kilogram of a prostaglandin substance selected from the group consisting of 15-methylprostaglandin E_2, 16-methylprostaglandin E_2 and 16,16-dimethylprostaglandin E_2, the corresponding lower alkyl esters thereof and the pharmaceutically acceptable salts thereof.

3,927,214

METHOD OF PREVENTING ASTHMATIC SYMPTOMS

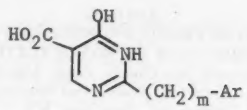
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 299,871, Oct. 24, 1972. This application Jan. 14, 1975, Ser. No. 541,008

Int. Cl.[2] A61K *31/505*

U.S. Cl. 424—251 4 Claims

1. The method of preventing asthmatic symptoms in a mammal subject to bronchoconstriction which comprises administering to said mammal an asthmatic symptom preventing amount of a compound selected from the group consisting of the formula:



and the pharmaceutically acceptable basic salts thereof wherein

Ar is pyridyl and

m is an integer of 0 or 1.

3,927,215

METHOD OF PREVENTING ASTHMATIC SYMPTOMS

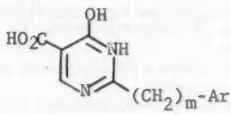
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 299,871, Oct. 24, 1972. This application Jan. 14, 1975, Ser. No. 541,018

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 **4 Claims**

1. The method of preventing asthmatic symptoms in a mammal subject to bronchoconstriction which comprises administrating to said mammal an asthmatic symptom preventing amount of a compound selected from the group consisting of the formula:



and the pharmaceutically acceptable basic salts thereof wherein

Ar is thienyl and

m is an integer of 0 or 1.

3,927,216

1,2,4-TRIAZOL E-3-CARBOXAMIDES FOR INHIBITING VIRUS INFECTIONS

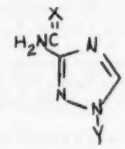
Joseph T. Witkowski, Laguna Niguel, and Roland K. Robins, Santa Ana, both of Calif., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 240,252, March 31, 1972, Pat. No. 3,798,209, which is a continuation-in-part of Ser. No. 149,017, June 1, 1971. This application Mar. 12, 1973, Ser. No. 340,332

Int. Cl.² A61K *31/41*

U.S. Cl. 424—269 **11 Claims**

1. A process of inhibiting the development of influenza, parainfluenza and herpes virus infections in warm blooded animals comprising administering to said warm blooded animals an effective amount of a composition containing from about 0.001 to about 10% by weight, based on the total weight of the composition of a compound of the structure:



wherein X is O or S, and Y is H or an alkalai metal.

3,927,217

COMBATING ANIMAL ACARID ECTOPARASITES WITH 2-PHENYLIMINOPYRROLIDINES

Edgar Enders, Cologne-Flittard, and Wilhelm Stendel, Wuppertal-Vohwinkel, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

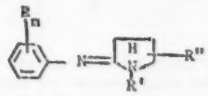
Division of Ser. No. 151,516, June 9, 1971, Pat. No. 3,787,576, which is a division of Ser. No. 834,537, June 21, 1968, abandoned. This application July 19, 1973, Ser. No. 380,774

Claims priority, application Germany, June 21, 1968, 1770681

Int. Cl.² A01N *9/22*

U.S. Cl. 424—274 **6 Claims**

1. The method of combating animal acarid ectoparasites which comprises applying to at least one of (a) such ectoparasites and (b) their animal habitat an ectoparasiticidally effective amount of a 2-phenylimino-pyrrolidine of the formula



in which R is chloro, *n* is a whole number from 2–3, and R′ is alkyl of 3 carbon atoms, and R″ is hydrogen.

3,927,218

3,4-BISAMINO-5-SULFAMOYLBENZOIC ACIDS USEFUL AS DIURETIC AGENTS

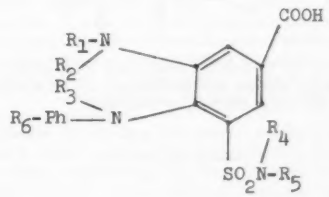
Lincoln Harvey Werner, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 13, 1972, Ser. No. 297,531

Int. Cl.² A61K *31/34*; **A61K** *31/38*

U.S. Cl. 424—285 **4 Claims**

1. A pharmaceutical composition comprising a diuretically effective amount of a compound corresponding to the formula



in which R_1 is Hc-lower alkyl or -alkenyl wherein Hc is furyl or thienyl, unsubstituted or substituted by one or two lower alkyl groups, Ph is phenylene, unsubstituted or substituted by one or two substituents selected from lower alkyl, hydroxy, mercapto, lower alkoxy, lower alkylenedioxy, lower alkylmercapto, halogeno, (hydroxy or halogeno)- lower alkyl or -alkoxy, nitro, amino, di-lower alkylamino, carboxy, sulfo, lower carbalkoxy, cyano, carbamyl or sulfamoyl, each of R_2, R_3 and R_4 is hydrogen or lower alkyl R_5 is hydrogen, lower alkyl or R_7-Ph and one of R_6 and R_7 is amino and the other hydrogen, or a lower alkyl ester or the ammonium, sodium, potassium, magnesium or calcium salt or acid addition salt thereof derived from a therapeutically useful acid, together with a pharmaceutical excipient.

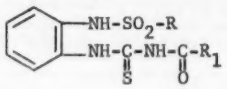
3,927,219

METHOD OF CONTROLLING PESTS WITH THIOUREIDO CARBAMATES COMPOUNDS

Alexander Mihailovski, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 217,697, Dec. 29, 1971, Pat. No. 3,832,384. This application June 12, 1974, Ser. No. 478,485
Int. Cl.[2] A01N 9/12
U.S. Cl. 424—300 29 Claims

1. A method of controlling pests selected from the group consisting of fungi and bacteria consisting of adding to the habitat thereof a fungicidally and bactericidally effective amount of a compound having the generic formula:



wherein R can be selected from lower alkyl, lower haloalkyl, phenyl, substituted phenyl wherein said substituents can be selected from halogen and lower alkyl; R_1 can be selected from lower alkoxy and lower thioalkyl.

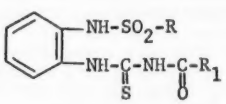
3,927,220

METHOD OF CONTROLLING PESTS WITH THIOUREIDO SULFONANILIDE COMPOUNDS

Alexander Mihailovski, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 217,697, Dec. 29, 1971, Pat. No. 3,832,384. This application June 12, 1974, Ser. No. 478,489
Int. Cl.[2] A01N 9/16
U.S. Cl. 424—321 9 Claims

1. A method of controlling pests selected from the group consisting of fungi and bacteria consisting of adding to the habitat thereof a fungicidally and bactericidally effective amount of a compound having the generic formula:



wherein R can be selected from lower alkyl, phenyl, substituted phenyl wherein said substituents can be selected from halogen and lower alkyl; R_1 is lower alkyl.

3,927,221

COLD WATER-SOLUBLE GELATIN COMPOSITION AND PROCESS OF PREPARING SAME

Nicholas J. Kalafatas, Arlington; Harold Rosenthal, Newtonville, and George A. Consolazio, Burlington, all of Mass., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 7, 1973, Ser. No. 358,204
Int. Cl.[2] A23L 1/06
U.S. Cl. 426—576 10 Claims

1. A process of preparing a cold water-soluble gelatin composition which comprises admixing a sugar and gelatin, adjusting the moisture content of the admixture to from about 2.5 to about 6 percent by weight, subjecting the admixture to heat and pressure while applying shearing forces to the admixture in a closed system and extruding the admixture to obtain a cold water-soluble gelatin composition.

3,927,222

METHOD OF PRODUCING EXPANDED CEREAL PRODUCTS OF IMPROVED TEXTURE

Allen H. Rosenquest, New Canaan, Conn.; Aloysius J. Knipper, Ramsey, and Robert W. Wood, West Milford, both of N.J., assignors to Nabisco, Inc., New York, N.Y.

Filed Jan. 15, 1975, Ser. No. 541,130
Int. Cl.[2] A23L 1/18
U.S. Cl. 426—621 8 Claims

1. The method of preparing an expanded ready to eat cereal product having a cellular structure wherein the cells are substantially all of uniform small size comprising the steps of mixing with a quantity of milled grain between about 0.2 and 2% of finely divided, insoluble, inert material selected from the group consisting of titanium dioxide, calcium silicate, aluminum oxide, silicon dioxide, or mixtures thereof, heating the mixture to a temperature above the boiling point of water and mechanically working the heated mixture at a pressure substantially above atmospheric, and expanding the mixture by suddenly releasing the pressure to form cells of uniform small size.

3,927,223

METHOD OF FORMING REFRACTORY OXIDE COATINGS

Mitsuo Takabatake, Tokyo, and Kikuo Tsuji, Yokohama, both of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed May 10, 1973, Ser. No. 358,867
Claims priority, application Japan, May 11, 1972, 47-45840
Int. Cl.[2] B05B 7/22; B05D 1/08
U.S. Cl. 427—34 13 Claims

1. A method of forming a refractory metal oxide coat on a substrate, which comprises:

applying a $MgO—MgO.Al_2O_3$ refractory metal oxide containing 5–30% periclase and 95–75% spinel oxide by a flame spraying technique to the surface of said substrate thereby depositing said refractory metal oxide on a surface of said substrate as a coated membrane.

3,927,224

LUMINESCENT AND/OR PHOTOCONDUCTIVE MATERIALS

Leon Levene, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 208,393, Dec. 15, 1971, Pat. No. 3,816,328. This application Oct. 18, 1973, Ser. No. 407,713
Int. Cl. H01b 1/04
U.S. Cl. 427—64 2 Claims

1. A process for producing a luminescent or photoconductive device which comprises: applying a luminescent or photoconductive oxide product onto an inorganic substrate wherein said product is made by a process which comprises:

1. reacting a silicon alkoxide of the formula $Si(OR)_4$, wherein R is an alkyl of 1 to 6 carbon atoms with about 0.3 to about 1.5 equivalents of water per equivalent of said silicon alkoxide in the presence of an effective catalytic amount of an acid hydrolysis catalyst so as to prepare a clear solution of a partially hydrolyzed silicon alkoxide,
2. combining said solution of a partially hydrolyzed silicon alkoxide with a metal alkoxide of the formula $M(OR')_X$, wherein M represents a cation, R' is an alkyl of 1 to 6 carbon atoms, and X is an integer dependent upon the valence of the cation, and allowing said combined ingredients to react so as to form a clear solution of a soluble, further hydrolyzable metallosiloxane having residual OR and OR' groups,
3. reacting said solution of a soluble metallosiloxane with a water solution of a metal compound that decomposes to a metal oxide below about 600°C., sufficient water being employed to react with said residual OR groups and OR'

groups so as to obtain a clear solution which subsequently converts to a clear gel structure,

and wherein, prior to the formation of said gel structure, there is added in any of Steps 1 to 3, an effective photoconductive amount of an inorganic photoconductive material or an effective luminescent amount of an inorganic luminescent material; 4. heating said gel structure at a temperature and for a time sufficient to convert said gel structure to an oxide product; heating said oxide product to a temperature and for a time sufficient to convert said product to a homogeneous glass containing said luminescent or photoconductive material.

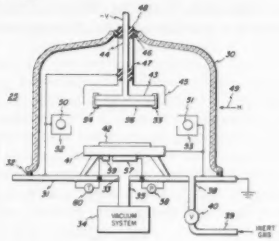
3,927,225
SCHOTTKY BARRIER CONTACTS AND METHODS OF MAKING SAME

Linus F. Cordes, and Marvin Garfinkel, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 318,394, Dec. 26, 1972. This application Aug. 15, 1974, Ser. No. 497,528

Int. Cl.² B05D *5/12*

U.S. Cl. 427—84 **9 Claims**



1. A method of forming a contact of platinum silicide to a body of silicon semiconductor material comprising

exposing a face of said body,

heating said body to a temperature greater than 400°C and less than 700°C,

depositing platinum on said face to form a conductive layer of a platinum silicon compound thereon while maintaining said body of silicon semiconductor material at a temperature in said range of greater than 400°C and less than 700°C.

3,927,226
METHOD OF TREATING COPIED PLANS

Yahiko Kadono, and Yanosuke Kadono, both of Suita, Japan, assignors to Kadono Chemical Laboratory Co., Ltd., Suita, Japan

Filed Oct. 19, 1973, Ser. No. 407,983

Claims priority, application Japan, May 30, 1973, 48-61352

Int. Cl.² B05D *1/38;* **B32B** *25/06*

U.S. Cl. 427—140 **4 Claims**

1. A method of coating the surface of copied plans to prevent staining and to make them more durable, which comprises the steps of first, applying to the surface of the copied plans, an aqueous creamy mixture of glue or gelatine as the principal ingredient, which has been compounded with effective amounts of a surface active agent, a polyethylene glycol, paraoxybutyl benzoate and further cetyl alcohol, stearyl alcohol or spermaceti; drying the surface to form a first film thereon, and applying a second aqueous solution of ammonium alum, iron alum, chromium alum or aluminum alum on the surface of the first film to form a second film on the copied plans.

2. A method according to claim 1, wherein the thus-coated copied plans are corrected by erasing and wherein the corrected portion thereof, is further coated by forming a first and second film on the surface thereof, according to the steps of claim 3.

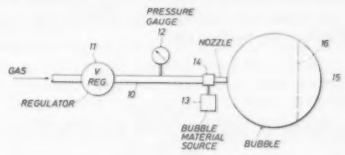
3,927,227
METHOD FOR MANUFACTURING MIRRORS IN ZERO GRAVITY ENVIRONMENT

David E. Pitts, Houston, Tex., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Feb. 27, 1974, Ser. No. 446,560

Int. Cl.² B32B *3/00;* **C23C** *11/00*

U.S. Cl. 427—162 **3 Claims**



1. A method for manufacturing a mirror surface in a zero gravity environment comprising the steps of

locating a structure defining a concave surface in the form of a spherical segment or paraboloid of revolution in a space orbit having a zero gravity environment,

providing a vaporizable metal at the focus of said surface in an amount calculated to provide a thin layer of metal on said surface, and

orienting the central axis of said surface toward the sun thereby vaporizing said metal by solar heat and

depositing the vaporized metal on said surface.

3,927,228
METHOD OF DEPOSITING TITANIUM DIOXIDE LAYERS BY EVAPORATION OF A MOLTEN TITANTIUM-OXYGEN PHASE

Hans K. Pulker, Triesen, Liechtenstein, assignor to Balzers Patent-und Beteiligungs-Aktiengesellschaft, Liechtenstein

Filed May 6, 1974, Ser. No. 467,572

Claims priority, application Switzerland, May 21, 1973, 7233/73

Int. Cl.² C23C *11/08;* **B29O** *11/00*

U.S. Cl. 427—162 **5 Claims**

1. A method of producing TiO_2 layers on a layer support, comprising evaporating a melt containing titanium and oxygen having a composition corresponding to a proportion of the number of oxygen atoms to the number of titanium atoms of from 1.6 to 1.8, and condensing the vapor on a layer support in the presence of oxygen.

4. A method of producing TiO_2 layers on a layer support, according to claim 1, wherein the melt comprises Ti_3O_5.

5. A method of producing TiO_2 layers on a layer support, according to claim 1, wherein said melt comprises Ti_4O_7.

3,927,229
METHOD FOR THE PRODUCTION OF POROUS WEBS WITH A LEATHER-LIKE GRAIN

Ulrich Rall, Langenfeld; Karl Mahall, Monheim-Baumberg, and Wilfried Kuper, Dusseldorf-Nord, all of Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Germany

Filed Nov. 13, 1972, Ser. No. 305,804

Claims priority, application Germany, Dec. 27, 1971, 2164852

Int. Cl.² B05D *1/00, 3/02, 3/12, 5/00*

U.S. Cl. 427—171 **16 Claims**

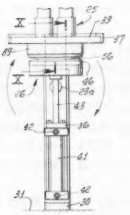
1. A method for the production of textile webs having high porosity and absorbency, with a leather-like surface grain consisting essentially of the steps of roughening a basic fabric of shrinkable fibers having a thread density of 10 to 20 threads

per centimeter in warp and weft directions and having a shrinking capacity of 2 to 15% in warp and weft directions, on at least one side in order to raise the height of the pile above the surface of the fabric from about 0.4 to 5 mm; optionally stretching the fabric in warp or weft direction up to 7%; impregnating at least one side of the fabric with an aqueous fluid foam containing a dispersion of a polymeric compound hardenable at a temperature above 120°C, until the foam penetrates at least completely through the pile with said fluid foam being worked into the basic fabric until the fibers are saturated with and covered by said fluid foam to a substantial degree; drying the impregnated fabric; heating the dried impregnated fabric at 120° to 160°C for a time sufficient to harden said polymeric compound; shrinking the dried impregnated fabric by treatment with hot water or steam; and recovering said textile webs having a high porosity and absorbency with a leather-like surface grain.

3,927,230
METHOD OF DECORATING A SURFACE OF AN ARTICLE

William E. MacDonald, Los Angeles, and Robert C. Harris, Jr., Glendale, both of Calif., assignors to Interpace Corporation, Parsippany, N.J.

Division of Ser. No. 408,200, Oct. 19, 1973, Pat. No. 3,885,522. This application Sept. 6, 1974, Ser. No. 503,844
Int. Cl.² B05D *1/30*
U.S. Cl. 427—282 **12 Claims**



1. In a method of applying a thick film of flowable colorant composition material on a ceramic body in accordance with a selected design, the combination of the steps of:

providing pattern defining means comprising an opening to a mold chamber, edge margins of said mold chamber being resilient and non-porous;

sealingly engaging said edge margins against the surface of an article to be decorated;

flowing a thick fluid composition material by gravity from said chamber directly to said pattern defining means onto areas of the article surface exposed within said pattern defining means;

maintaining said fluid composition material in contact with said article surface for a preselected time period;

reversing the position of said pattern defining means and article while maintaining sealed engagement thereof for removing by gravity flow fluid composition material which has not been applied to said article surface from the vicinity of said pattern defining means;

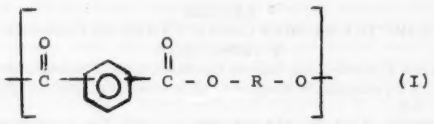
and separating said article surface and said pattern defining means.

3,927,231
FLAMEPROOFING OF LINEAR POLYESTERS

Gerard Desitter, Ternay, and Gilbert Vivant, Lyon, both of France, assignors to Rhone-Poulenc S.A., Paris, France

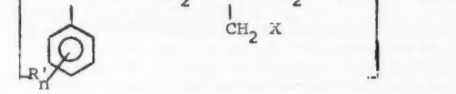
Filed Feb. 25, 1974, Ser. No. 445,546
Claims priority, application France, Feb. 28, 1973, 73.07092
Int. Cl.² C08J *7/02;* **C08L** *67/00*
U.S. Cl. 427—390 **11 Claims**

1. A flameproof composition which comprises at least one linear polyester possessing a plurality of units of the general formula:



(I)

in which R represents a linear or branched alkylene group containing 2 to 6 carbon atoms, and 0.5 to 40% by weight, based on the weight of the polyester, of at least one polyphosphonate possessing a plurality of units of the general formula:



(II)

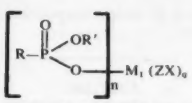
in which R′ represents a hydrogen atom, a halogen atom or an alkyl radical containing 1 to 4 carbon atoms optionally substituted by one or more halogen atoms, *n* represents an integer from 1 to 3 and X represents a chlorine or bromine atom.

3,927,232
LUBRICATING COMPOSITIONS CONTAINING METAL PHOSPHONATES

Joseph J. Dickert, Jr., and Carleton N. Rowe, both of Lower Makefield Township, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 280,604, Aug. 14, 1972, Pat. No. 3,798,162, which is a continuation-in-part of Ser. No. 70,901, Sept. 9, 1970, abandoned. This application Oct. 1, 1973, Ser. No. 402,238
Int. Cl. C23f *7/08*
U.S. Cl. 427—401 **13 Claims**

1. A method of depositing a free metal upon a lubricated metal surface comprising contacting said metal surface with a lubricant composition comprising a lubricant and from about 0.001 to about 10% of a compound of the formula



wherein R is a hydrocarbyl containing from 14 to about 30 carbon atoms, R′ is a hydrocarbyl containing from 1 to about 6 carbon atoms, X is a basic nitrogen-containing compound, Z is 1 to 4, q is 0 or 1, M is a metal selected from the group consisting of copper, silver and gold and n is the valence of M, q being 1 and n being 3 when M is gold wherein reduced metal is obtained, which metal is deposited on the lubricated surface.

3,927,233

WELDED POLYMERIC ARTICLES AND PROCESS

Robert J. Naidoff, Mountain View, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 25, 1974, Ser. No. 436,674
Int. Cl.² B32B *3/10*
U.S. Cl. 428—58 **12 Claims**

1. A method of integrally joining abutting surfaces of crosslinked polymeric articles which comprises disposing between said surfaces an insert consisting essentially of a melt processable thermoplastic polymeric composition capable of being crosslinked by heat-activated systems containing an effective cross-linking amount of a heat-activated cross-linking agent, and heating said surfaces and insert under compression for a time at a temperature sufficient to cause said insert to flow and wet said surfaces and to activate said cross-linking agent, effecting formation of covalent cross-links between each of said surfaces and the polymeric constituent of said insert, the modulus of the resulting cross-linked butt weld being at least equal to that of said articles.

3,927,234

IMPREGNATING COMPOUND FOR FIBER GLASS MATS

Heinz-Joachim Lindner, Nurnberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 25, 1972, Ser. No. 291,935
Claims priority, application Germany, Sept. 29, 1971, 2148692
Int. Cl.² B32B *17/00, 27/04, 17/04*
U.S. Cl. 428—273 **5 Claims**

1. An impregnated fiber glass mat comprising:
a. a fiber glass mat material and
b. an impregnating composition for said mat material comprising a mixture of:
1. repurified epoxy resin based on bis-phenol A having a maximum chlorine content of 0.1 percent by weight; and 2. at least one hardenable hydrocarbon polymer comprising a polybutadiene base having at least 60 percent of the 1,2 adduct, the weight ratio of said epoxy resin to said polymer being between 6 to 4 and 9 to 1.

3,927,235

RECONSTITUTED BOARD PRODUCTS FROM PLANT-FIBER RESIDUES

Poo Chow, 907 Shurts St., Urbana, Ill. 61801

Filed Mar. 18, 1974, Ser. No. 452,191
Int. Cl.² B32B *27/42, 23/04, 29/00*
U.S. Cl. 428—302 **9 Claims**

1. A particle board panel comprising a sandwich, laminate-like structure formed in a one-step pressing and heating step, having (a) an inner core layer containing as a major ingredient exo-s-plant fibers predominantly smaller than 30 mesh, Tyler screen size, and a minor amount of heat-sensitive adhesive, said heat-sensitive adhesive comprising a thermosetting adhesive as the primary binder for said exo-s-plant fibers, said inner core layer being formed in said one-step heating and pressing step from a mat comprising at least 50% exo-s-plant fibers, total fiber dry weight basis and having a moisture content of from about 6 to about 18%, total weight basis, for said exo-s-plant fibers and (b) two face layers, enclosing said inner core layer, each of said face layers containing as a major ingredient s-plant fibers bonded with an adhesive.

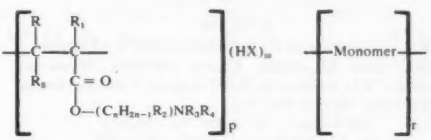
3,927,236

RESIN COMPOSITIONS, METHODS OF APPLYING THE SAME TO POROUS MATERIALS, AND THE RESULTING PRODUCTS

Jay S. Shultz, Little Rock, Ark., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed May 16, 1973, Ser. No. 360,717
Int. Cl.² D06M *15/12*
U.S. Cl. 428—304 **6 Claims**

1. A method of applying a stable, colloidal, aqueous resin composition to porous materials and controlling its migration thereon or penetration thereinto which comprises: mixing the following ingredients in the sequence set forth to form an aqueous synthetic resin composition having a pH value between 2.5 and 10: (1) 0.1% to 60% by weight of a synthetic resin; and (2) adding to said synthetic resin 0.01% to 8% by weight, based on the weight of the synthetic resin of a water-soluble, cationic polyelectrolyte polymer having a molecular weight of at least 20,000 and having the following structural formula:



wherein:
R and R_1 are hydrogen, methyl, or ethyl;
R_2 and R_3 and R_4 and R_6 are hydrogen or alkyl from 1 to 4 carbon atoms;
R_5 is hydrogen, $-COOR_6$ or $-COO(C_nH_{2n-1}R_2)NR_3R_4$;
m is a number from ½ to 2;
n is a number from 2 to 4;
x is nitrate, chloride, bromide, iodide, phosphate, formate, propionate, citrate, butyrate, sulfate, acetate, or an acidic anionic group derived from an organic or inorganic acid;
p and r are the percentages of the two reacting monomers, in which $p + r = 100\%$ and p is at least about 50 mole percent and r is less than about 50 mole percent down to 0 mole percent; and "Monomer" is acrylamide, diacetone acrylamide, t-butyl acrylamide, methacrylamide, methyl, vinyl, ether, ethyl vinyl ether, lower alkyl esters of acrylic and methacrylic acids, hydroxyethyl acrylate, hydroxyethyl methacrylate, hydroxypropyl acrylate, hydroxymethyl methacrylate, vinyl acetate, vinyl chloride, ethylene, and other ethylenically unsaturated monomers capable of copolymerizing with the aminoalkylated monomer on the left hand side in the structural formula to form copolymers therewith; and applying said aqueous resin composition to porous materials to control migration thereon and penetration thereinto.

3,927,237

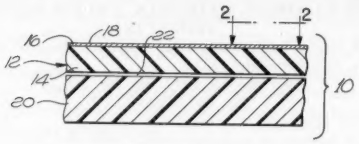
TYPING SHEET FOR THERMAL DUPLICATING PROCESSES

Joseph Tat-Hin Sund, Los Angeles, Calif., assignor to Bell & Howell Co., Chicago, Ill.

Filed Oct. 25, 1973, Ser. No. 409,529
Int. Cl.² B32B *5/16, 19/04*
U.S. Cl. 428—325 **8 Claims**

1. An improved image control means for a thermal duplicating process, comprising, in combination:

an original compliant typing sheet having a thickness of about 1.5–2.5 mils, said sheet having a typing surface receptive to typing ink and resistant to ink transfer therefrom, said surface being coated with a substantially uniform mixture of oil receptive particles having an average diameter of less than 4 microns and having an oil absorption of at least 30 weight percent, and oil resistive particles having an average diameter of at least 8 microns and



having an oil absorption of less than 20 weight percent, said particles being selected from the group consisting of inorganic salt, inorganic oxide and mixtures thereof dispersed in a dry adhesive binder, the volume ratio of said oil receptive particles to said oil resistive particles being about 0.5:1 to about 8:1; and

a smooth resilient backing sheet abutted against the back of said typing sheet, said backing sheet having a thickness of about 2–5 mils.

3,927,238

LEAD-FREE GLAZE FOR HIGH DENSITY ALUMINA

Frank Vincent DiMarcello, Clinton Township, Hunterdon County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 7, 1973, Ser. No. 358,004
Int. Cl.² B32B *17/06;* **C03C** *5/02, 3/04*
U.S. Cl. 428—336 **5 Claims**

1. Article comprising a high density alumina substrate and a fired glaze covering at least a portion of a surface of said substrate characterized in that said glaze has a thickness not exceeding 1 mil and further characterized in that said glaze consists essentially of the following components in the amounts indicated:

	Percent by Wt.
SiO_2	50–65
Al_2O_3	2–6
SrO	15–30
CaO	3–10
BaO	3–10.

3,927,239

FLEXIBLE STRIP COATED WITH A PRESSURE-SENSITIVE ADHESIVE COMPOSITION TACKIFIED WITH PHENOL-DIENE-PHENOL RESIN ADDUCT

Ramsis Gobran, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 23, 1973, Ser. No. 408,590
Int. Cl.² C09J *7/02*
U.S. Cl. 428—355 **4 Claims**

1. A pressure-sensitive adhesive article comprising a flexible self-supporting strip coated over one major surface with a thin layer of a pressure-sensitive adhesive composition comprising: 1. 5 to 200 parts by weight of a phenol-diene-phenol adduct wherein the diene portion is essentially free of ethylenic unsaturation having a molecular weight of at least 400, said adduct being produced by reacting, in an inert atmosphere, in the presence of a Friedel-Crafts catalyst and at a temperature in the range of 20°C–135°C, 1 mole of non-conjugated diene with 2 moles of a phenolic compound having only one ring carbon atom which is susceptible to alkylation, and

2. about 100 parts by weight cis-polybutadiene or natural rubber polymer.

3,927,240

HAZE RESISTANT CATHODE LUMINESCENT SULFIDE PHOSPHORS AND METHOD OF PREPARING SAME

Michael J. Hammond, Ulster, and Raymond F. Herner, Towanda, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 12, 1974, Ser. No. 478,696
Int. Cl.² C09K *11/42, 11/02*
U.S. Cl. 428—403 **11 Claims**

1. A cathodoluminescent phosphor composition consisting essentially of from about 99.6 percent to about 99.9 percent by weight of discrete particles of an activated host of a divalent metal sulfide and, as a coating over the surfaces of said particles, from about 0.1 percent to about 0.4 percent by weight on a P_2O_7 basis of a pyrophosphate selected from the group consisting of calcium pyrophosphate and strontium pyrophosphate.

3,927,241

FRICTION ELEMENTS RUNNING IN OIL

Wilfried Augustin, Wittenkamp, Germany, assignor to Jurid Werke GmbH, Glinde near Hamburg, Germany

Filed Aug. 8, 1974, Ser. No. 495,807
Claims priority, application Germany, Aug. 10, 1973, 2340464
Int. Cl.² F16D *55/36;* **D04H** *3/02*
U.S. Cl. 428—408 **4 Claims**

1. A friction member for friction engaging mechanisms adapted to operate in oil comprising a support plate and a friction facing bonded to the support plate, said friction facing consisting essentially of a web of carbon filaments impregnated with a cured duroplast organic resin bonding agent.

2. A friction member for use in wet clutches adapted to operate in connection with bringing two rotating parts into synchronism, comprising a steel support plate, an intermediate layer of asbestos fibers bonded to the steel member and a friction facing bonded to the layer of asbestos fibers, said friction facing consisting essentially of a web of carbon filaments impregnated with a cured duroplast organic resin bonding agent.

3. A friction member for use in wet clutches and automatic transmission comprising a metal support plate and a surface lining of a web of carbon filaments compacted with a cured duroplast organic resin binder and bonded between the support plate and the surface lining, an intermediate layer of a fibrous material other than carbon fibers.

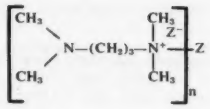
3,927,242

SUBSTRATE COATED WITH A LAYER OF POLYQUATERNARY POLYELECTROLYTES

Alan Rembaum, and Shiao-Ping Siao Yen, both of Altadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 280,649, Aug. 14, 1972. This application Dec. 26, 1973, Ser. No. 427,916
Int. Cl.² B32B *21/04, 21/06, 23/08, 27/10*
U.S. Cl. 428—411 **9 Claims**

1. An article of manufacture comprising an inert substrate sheet containing from 0.1 to 5 pounds per 1,000 square feet of substrate surface of a layer of a water-soluble, conductive polyelectrolyte of the formula:



where Z is bromo, chloro or iodo and *n* is an integer such that the intrinsic viscosity is at least 0.20 dl/g as determined by means of light scattering in 0.4 molar KBr according to the relationship:

$$\eta = (2.94 \times 10^{-4})M^{0.61}$$

where η = intrinsic viscosity and M is molecular weight.

3,927,243

ALUMINIUM ENAMELS

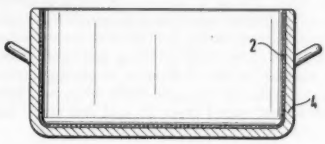
Gunter Theisen, Riedlingen, Wurttemberg, Germany, assignor to Oberschwabische Metallwarenfabrik GmbH & Co. K.G., Riedlingen, Wurttemberg, Germany

Continuation of Ser. No. 92,682, Nov. 25, 1970, abandoned. This application Apr. 11, 1973, Ser. No. 349,947

Claims priority, application Germany, Nov. 27, 1969, 1959613

Int. Cl.² C22D *5/00*

U.S. Cl. 428—433 **8 Claims**



1. A method for producing improved enameled aluninium food handling articles comprising:

preparing an aluminium enamel coating composition consisting essentially of SiO_2, TiO_2, at least one R_2O compound, wherein R is an alkali metal and a quantity of Bi_2O_3 sufficient to dissolve the TiO_2; and

coating a food contacting surface of an aluminium food handling article with said composition.

3,927,244

COMPOSITE FILM

Shuichi Ogura; Hirotsura Chow, and Toshio Kawamata, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 6, 1973, Ser. No. 385,770

Claims priority, application Japan, Aug. 7, 1972, 47-78874

Int. Cl.² B32B *27/20, 27/36*

U.S. Cl. 428—483 **15 Claims**

1. A composite film comprising a polyester film and coated on one or both surfaces thereof, a composition containing at least one member selected from the group consisting of:

a. a polyethylene terephthalate oligomer,

b. a polyglycol terephthalate copolymer,

c. a composition comprising a blend of a polyglycol terephthalate copolymer with a linear thermoplastic polyurethane elastomer;

d. a composition comprising a blend of a polyglycol terephthalate copolymer with a mixture of a linear thermoplastic polyurethane elastomer and a polyisocyanate; and

e. a composition comprising a blend of a polyglycol terephthalate copolymer with at least one of poly(vinyl acetate), an ethylene/vinyl acetate copolymer and a tacky polyolefin, said member permitting said composite film to be heat-bondable at a temperature of 110°–120°C.

3,927,245

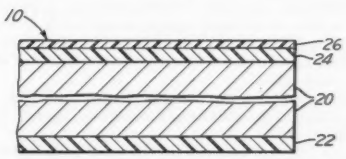
RESIN-COATED CARTON BLANK

Clarence Edward Roth, Jr., Orange; Robert L. Hughes, Houston, both of Tex., and Kenneth F. Thompson, Canton, N.C., assignors to Gulf Oil Corporation, Pittsburgh, Pa., by said Clarence Edward Roth and Robert L. Hughes and Champion International Corporation, New York, N.Y., by said Kenneth F. Thompson

Filed July 5, 1974, Ser. No. 486,224

Int. Cl.² B65D *5/56;* **C08F** *29/12;* **D21H** *1/36*

U.S. Cl. 428—513 **4 Claims**



1. A scored, resin-coated, fiber board blank for a liquid carton, consisting essentially of:

1. a fiber board core having a thickness of about 15 to 30 mils,

2. a first ethylene polymer coating directly bonded to the side of the blank that will form the interior of the ultimate carton, said coating being about 0.5 to 1.2 mils thick,

3. a second ethylene polymer coating directly bonded to the side of the blank that will form the exterior of the ultimate carton, said coating being about 0.2 to 0.5 mil thick, and

4. an olefin polymer coating directly bonded to said second ethylene polymer coating, said olefin polymer coating being less than about 0.1 mil thick;

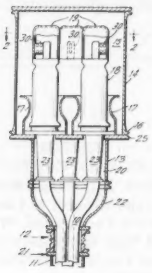
the ethylene polymer contained in said first and second ethylene polymer coatings being an ethylene polymer having a density of less than about 0.93 gram/cm³ and a melt point of less than about 108°C., the olefin polymer contained in said olefin polymer coating being either an ethylene polymer having a density of at least about 0.96 gram/cm³ or a highly crystalline propylene polymer which has a solubility of less than 5% in boiling heptane; each of the three polymer coatings being free of any added slip agent; the coefficient of friction between the olefin polymer coated surface of the blank and polished stainless steel being from about 0.2 to about 0.4.

ELECTRICAL

3,927,246
THREE-PHASE CABLE TERMINATION FOR METAL ENCLOSED COMPRESSED GAS-INSULATED SUBSTATION

Vasu H. Tahiliani, New Stanton, and Howard W. Graybill, Greensburg, both of Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Aug. 26, 1974, Ser. No. 500,407
Int. Cl.² H02G *15/22*
U.S. Cl. 174—19 **4 Claims**



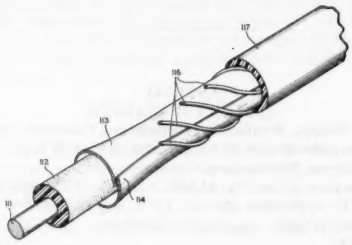
1. A multi-phase cable termination structure for a metal enclosed compressed gas insulated substation, comprising:
- a first and second chamber,
- a multi-phase pipe-type cable introduced into said first chamber, said first chamber including a flared housing portion to permit spreading of said cable to wider spacing,
- a terminal member on each phase conductor of said multi-phase cable;
- said second chamber containing compressed gas,
- said second chamber being located adjacent said first chamber,
- a gas tight seal between said first and second chamber,
- said terminal members each extending from said first chamber through said gas tight seal into said second chamber, and a plurality of tubular members extending from said second chamber;
- a single phase conductor in each said tubular member;
- and an electrical connection from each said terminal member to each said conductor;
- said terminal member being sealed at the point of passage thereof through said gastight seal,
- each tubular member communicating with said second chamber and being filled with the same type of compressed gas used in said second chamber,
- each of said single phase conductors electrically insulated from its respective said tubular member by said compressed gas.

3,927,247
SHIELDED COAXIAL CABLE

Frank E. Timmons, Richmond, Ind., assignor to Belden Corporation, Chicago, Ill.

Continuation of Ser. No. 765,286, Oct. 7, 1968, abandoned. This application Oct. 30, 1970, Ser. No. 85,810
Int. Cl.² H01B *11/06*
U.S. Cl. 174—36 **3 Claims**

1. A bendable, flexible coaxial cable for carrying RF signals such as high frequency TV signals comprising an elongated central flexible conductor for carrying the RF signals, a flexible insulating layer of low loss cellular material surrounding said conductor, an elongated, longitudinally extending foil strip encircling and engaging said insulating layer and having its opposite longitudinally extending marginal portions overlapped to form an elongated longitudinally extending seam along the length of the cable, said foil strip having an inductance compatible with the carrying of high frequency RF signals by said central conductor, said foil strip having a flexible polymeric tape layer and a layer of metal on at least one side of said polymeric layer whereby said conductor may be shielded by said metal layer, said polymeric layer engaging said layer of insulating layer of cellular material, a plurality of flexible drain conductors wrapped generally helically around and along and in electrical contact with said metal layer of said foil strip, said drain wires being spaced from said central conductor by said insulating layer and said foil strip, said drain

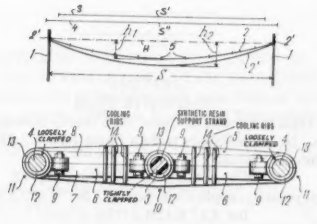


conductors being helically wrapped with a predetermined periodicity and spaced from each other uniformly, said portions of the drain wires on the side of the cable under compression during flexure of the cable being free to move toward each other axially along the spaces between drain wires and along the cable, during flexure of the cable said drain wire portions under tension being free to move away from each other axially along the cable, said drain wires providing tensile strength for said cable while allowing said cable to bend, and an outer tubular jacket of flexible insulating material surrounding said helically wrapped drain wires and holding the same against said metal layer of said foil strip, said cable having a substantially right circular cross section.

3,927,248
OVERHEAD CABLE SYSTEM FOR POWER OR INFORMATION TRANSMISSION

Günter Schöll, Casa Rosina, CH 6549 Pianezzo, Paudo, Switzerland, and Joachim Pauls, Meisenweg 3, 7441 Wolfschlugen, Wurtt., Germany

Filed Apr. 8, 1974, Ser. No. 459,056
Claims priority, application Germany, Apr. 10, 1973, 2317894
Int. Cl.² H02G *7/06, 7/12;* **H01B** *17/54*
U.S. Cl. 174—41 **10 Claims**



1. An overhead system for transmitting electricity comprising:

a pair of upright towers spaced apart by a predetermined distance;

at least one synthetic-resin support strand extending between said towers and having a length in an unstressed condition less than said distance;

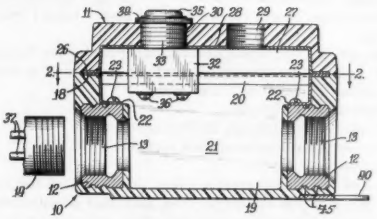
at least one conductive strand extending between said towers next to said support strand and having a length in an unstressed condition greater than said distance; and

means securing said strands together between said towers.

3,927,249
EXPLOSION PROOF PLASTIC ELECTRICAL ENCLOSURE

James N. Pearse, Libertyville, Ill., assignor to Appleton Electric Company, Chicago, Ill.

Filed Sept. 16, 1974, Ser. No. 506,247
Int. Cl.[2] H02G *3/14*
U.S. Cl. 174—51 **9 Claims**



1. In an explosion proof electrical enclosure comprising a box and a cover releasably attached to the box which box and cover have internal walls defining an internal opening for electrical wiring, said box and cover have mating faces at the juncture therebetween, the improvement comprising:

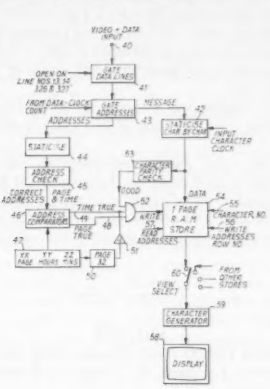
said box and cover being mainly formed of plastic and each including a metal flange at the respective face and circumscribing said opening at the face, said flanges being in immediate juxtaposition when said cover is on said box, said flanges being formed of an erosion resistant metal.

3,927,250
TELEVISION SYSTEM WITH TRANSMISSION OF AUXILIARY INFORMATION

Peter Rainger, Pinner, England, assignor to British Broadcasting Corporation, London, England

Filed Feb. 11, 1974, Ser. No. 441,502
Claims priority, application United Kingdom, Feb. 15, 1973, 7569/73
Int. Cl.[2] H04N *7/00*
U.S. Cl. 178—5.6 **14 Claims**

1. A television transmission system for broadcasting a television signal and comprising means for multiplexing with said television signal in at least one time slot different blocks of digitally coded data at different times of day, each of which blocks includes a code addressing the block and comprising a

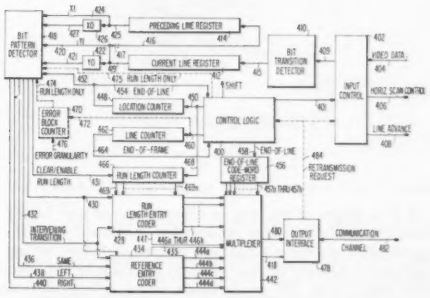


time code representing the time of day at which the block is transmitted.

3,927,251
METHOD AND APPARATUS FOR THE DETECTION AND CONTROL OF ERRORS IN TWO-DIMENSIONALLY COMPRESSED IMAGE DATA

Hugh Edward White, Pennington, and Michael David Lippman, Hightstown, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 361,451, May 18, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 513,038
Int. Cl. H04n *7/12*
U.S. Cl. 178—6 **13 Claims**



1. In a compressed image data facsimile system incorporating an encoder for encoding the respective locations of transitions between tones in a current scanned line of copy, said current scanned line having a predetermined length defined by initial and terminal points having given locations, said encoder utilizing run-length code-words manifesting the distance between transitions on said current scanned line and arranging said code-words serially in a group manifesting said current scanned line; and a decoder responsive to encoded signals transmitted thereto, said decoder detecting code-words and decoding said group of code-words to reconstruct the locations of the transitions, the improvement comprising therewith:

a. means including said encoder for encoding as a code-word the location of said terminal point of said scanned line as an additional transition;

b. means including said encoder for generating an end-of-line code-word to identify said additional-transition code-

word, thereby distinguishing said additional-transition code-word from other transition code-words;

c. means including said decoder for accumulating distances between successive transitions and generating a complete line signal when the manifested length of a decoded line corresponds to the predetermined length of a completely scanned line;

d. means including said decoder for generating an end-of-line signal when said end-of-line code-word is detected; and

e. error detecting means responsive to said end-of-line signal and to said complete line signal for generating an error signal manifesting the occurrence of an error when either of said end-of-line signal or said complete line signal occurs without the simultaneous occurrence of the other.

3,927,252

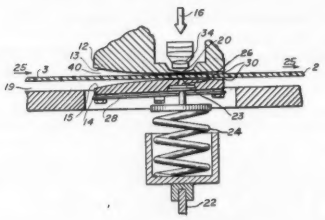
BIASED VIDEO DISC STABILIZER SYSTEM

Eugene J. Polley, Lombard, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 2, 1974, Ser. No. 457,289

Int. Cl.² G11B *15/64, 7/08*

U.S. Cl. 179—6.7 R **9 Claims**



9. In a player of the type in which a record disc having a surface bearing recorded information is rotated between a displaceable stabilizer block and a fixed stabilizer having a stationary reference surface mutually confronting and spaced from each other, for presentation to an optical detection system,

a method for stabilizing the plane of rotation of said information-bearing surface with respect to a predetermined focal plane of said optical detection system projected upon said information-bearing surface despite undesired thickness nonuniformities of said record disc, which method comprises:

spinning said disc through said space separating said displaceable stabilizer block and said stationary reference surface to generate aerodynamic forces in a predetermined gap between said information-bearing surface of said disc and said reference surface; and

biasing said displaceable stabilizer block for movement toward or away from said reference surface in response to said generated aerodynamic force variations attributable to such undesired disc non-uniformities, to effect changes in the stabilizer block and reference surface spacing to maintain said predetermined gap substantially constant despite such undesired disc non-uniformities.

3,927,253

OPTICAL DIFFRACTOMETERS

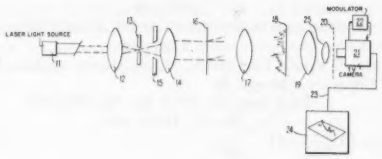
John Jungles, Thurmaston; David John Whitehouse, Melton Mowbray, and Eric Gordon Nightingale, Leicester, all of England, assignors to The Rank Organisation Ltd., London, England

Filed Mar. 22, 1974, Ser. No. 454,009

Claims priority, application United Kingdom, Mar. 22, 1973, 13831/73

Int. Cl.² H04N *7/18*

U.S. Cl. 178—6.8 **3 Claims**



1. In an optical diffractometer system of the type comprising:

a laser as light source,

holder means for supporting an object,

an image transformation unit for providing a Fourier transform of an object carried by said object holder means, and

an image reconstruction unit including means for focusing an image transform at a transform plane and a reconstructed image at an image plane,

the improvement wherein:

said laser is a multimode device, and

said image transformation unit includes

a condenser lens,

a first adjustable aperture stop positioned in the focal plane of said condenser lens, such that adjustments to the size of said aperture stop effect adjustments to said image transform quality,

a collimator lens from which substantially plane parallel light is directed towards an object carried by said object holder means, and

a second adjustable aperture stop located at the entrance pupil of said collimator lens, between said first adjustable aperture stop at the rear focal plane of said condenser lens and said collimator whereby adjustments to the size of said further adjustable aperture stop effect adjustments to one or both of said transform image at said transform plane and said reconstructed image at said image plane.

3,927,254

OPTICAL SEEKER SCANNING SYSTEM

Gerhard Lessman, Chino, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Mar. 13, 1975, Ser. No. 558,093

Int. Cl.² H04N *3/16, 3/00;* **F41G** *7/00;* **G02B** *5/20*

U.S. Cl. 178—7.1 **8 Claims**

1. In a seeker scanning system of the type comprising:

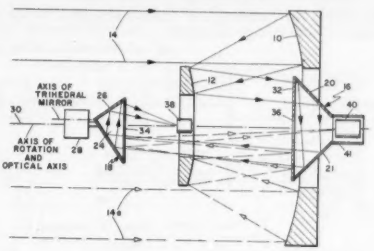
imaging means on a system optical axis, and means for directing an input ray bundle to the imaging means, the imaging means comprises,

dihedral reflector means disposed for rotation about the optical axis and effective to rotate the ray bundle at an angular rate twice its own,

trihedral reflector means disposed for rotation about the optical axis and adapted to intercept the ray bundle rotated by the dihedral reflector means and effective to invert and revert the ray bundle,

means for rotating dihedral and trihedral reflectors about the optical axis, and filter means associated with each of

said dihedral and trihedral reflectors for dissociating infrared wavelengths from visable wavelengths of the ray



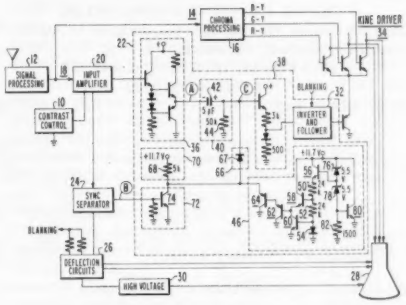
bundle by transmitting the infrared wavelengths and reflecting the visable wavelengths.

3,927,255

BLACK LEVEL CLAMPING CIRCUIT FOR A TELEVISION SIGNAL PROCESSOR

Bernard Joseph Yorkanis, South Plainfield, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 1, 1974, Ser. No. 465,891
Int. Cl.² H04N *5/44*
U.S. Cl. 178—7.3 DC **10 Claims**



1. A circuit for processing a television video signal, said video signal including periodic blanking pulses, each of said blanking pulses formed by a pedestal level and a sync pulse superimposed on said pedestal level, signals representative of image information disposed between said blanking pulses, and undesired noise components, said circuit operative to clamp said pedestal level to a reference level representative of the black tone of an image reproducing device, said circuit comprising:

a source of said video signals;

means for providing said video signals at a first circuit point at a low impedance;

means for utilizing said video signals coupled to a second circuit point;

capacitive means for capacitively coupling said video signals between said first and second circuit points;

a source of reference voltage;

a voltage follower amplifier having an input and an output terminal, said input terminal coupled to said source of reference voltage;

a current source coupled to said output terminal of said follower amplifier;

a unidirectional coupling device direct coupled between said output terminal of said follower amplifier and said second circuit point and poled to charge, when conducting, said capacitive means towards said pedestal level;

said current source including inpedance means for limiting the current for charging said capacitive means to inhibit charging said capacitive means in response to said noise components, said follower amplifier being rendered conductive to provide said reference voltage at said output terminal at a relatively low output impedance when a current above a predetermined value is supplied by said current source to said output terminal, said follower amplifier being rendered substantially nonconductive when said current supplied to said output terminal falls below said predetermined value, said impedance means having a value such that the current supplied to said output terminal of said follower amplifier falls below said predetermined value in response to said noise components; and

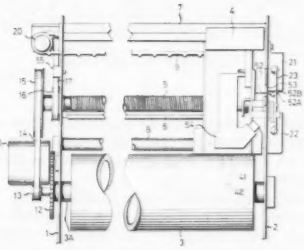
means coupled to said output terminal of said follower amplifier for rendering said unidirectional coupling device non-conductive and for diverting current from said output terminal of said follower amplifier such that the current supplied to said output terminal of said follower amplifier falls below said predetermined value in response to said sync pulses.

3,927,256

VARIABLE-RATE DRIVE MECHANISM FOR A FACSIMILE HEAD OR THE LIKE

Sakae Fujimoto, Chofu, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1974, Ser. No. 536,390
Claims priority, application Japan, Dec. 29, 1973, 48-3659
Int. Cl.² H04N *1/06*
U.S. Cl. 178—7.6 **6 Claims**



1. A device for moving an article along a feed direction comprising:

a rotatable threaded feed shaft extending along said feed direction;

frame means supporting said article and comprising a first and a second frame member moveable between a spaced-apart position and a close-together position with respect to the feed direction and biased toward one of said positions;

a first and a second half nut pivotally connected to the first and second frame member respectively, each half nut having a threaded portion behind the pivot point thereof as viewed in the feed direction and the pivot point of each half nut being radially outwardly of the shaft in the pivot plane, the threaded portion of each half nut being biased to threadably engage the feed shaft and to move in the feed direction together with the frame member connected thereto as the shaft rotates but pivoting away from the feed shaft when the frame member connected thereto is moved in the feed direction at a rate faster than the feed rate of an engaged half nut; and

activating means connecting the frame members to each other and energizable to move the frame members from their biased position to their other position and deenergizable thereafter to allow the frame members to return

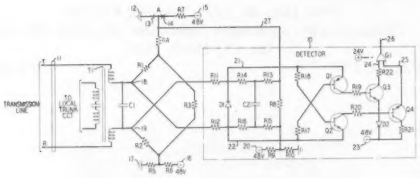
to their biased position, wherein the distance between the two positions of the frame members corresponds to moving one of the half nuts along a distance of at least one shaft thread;

whereby, when the activating means is energized the frame members move from their bias position to their other position along the feed direction and one of the half nuts skips at least one shaft thread along the feed direction and again engages the feed shaft, and upon subsequently deenergizing the activating means the biasing force between the frame members causes the other half nut to disengage from the feed shaft and to similarly skip at least one shaft thread as the frame members return to their biased position, thereby allowing for moving the article at a steady speed upon steady rotation of the feed shaft and for selectively moving the article faster by selectively energizing and deenergizing the activating means.

3,927,257
DUPLEX SIGNALING CIRCUIT

Dennis Lee Copenhafer, Cherry Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 5, 1974, Ser. No. 485,821
Int. Cl.[2] H04L *5/14*
U.S. Cl. 178—60 **6 Claims**



1. A signaling arrangement having an input from a transmission line and a receiver for detecting signaling voltages on said line that are summed with spurious voltages thereon, said receiver comprising

a first and a second source of potential,

first circuit means connected to said input for detecting ones of said signaling voltages that are within a range between said potentials and for further detecting others of said signaling voltages that have been shifted by said spurious voltages outside said range in a positive direction, and

second circuit means connected to said input for detecting said ones of said signaling voltages within said range and for further detecting others of said signaling voltages that have been shifted by said spurious voltages outside said range in a negative direction.

3,927,258
COMPATIBLE SCANNING SYSTEM

Eugene H. Dryden, San Marino, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 320,796, Jan. 3, 1973, abandoned. This application Oct. 21, 1974, Ser. No. 516,840
Int. Cl.[2] H04N *7/18*
U.S. Cl. 178—6.8 **2 Claims**

1. A system for displaying a plurality of sensors on a television monitor comprising:

a. a plurality of sensor channels;

b. a clock;

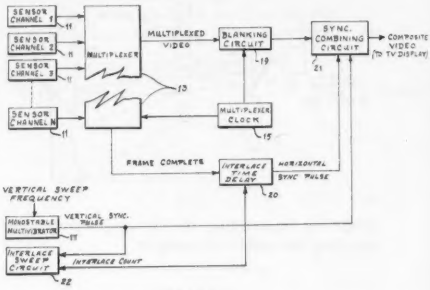
c. a multiplexer fed by the plurality of sensors and the clock;

d. a blanking circuit fed by the multiplexing clock and the multiplexer;

e. means for generating vertical synchronization pulses;

f. means for generating an interlace count fed by the vertical synchronization pulse generating means;

g. means for counting the vertical synchronization pulses;



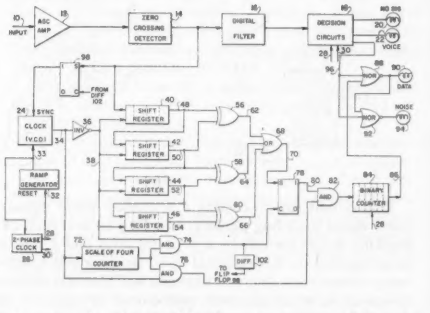
h. a time delay circuit fed by the multiplexer upon completion of the final channel and by the counting means, the output of the time delay circuit representing horizontal synchronization pulses; and

i. a combining circuit fed by the blanking circuit, the time delay circuit, and the counting circuit.

3,927,259
SIGNAL IDENTIFICATION SYSTEM

Robert M. Brown, Woodbridge, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Filed Feb. 13, 1974, Ser. No. 442,237
Int. Cl.[2] H04M *3/22*
U.S. Cl. 179—1 MN **42 Claims**



1. A system for distinguishing between noise and data signals in a communication line comprising:

a. means for providing a pulse train in response to excursions from a predetermined amplitude level in the signal applied to said communication line,

b. means for sampling the pulse train at a varying rate and retaining temporarily the pulses which are sampled,

c. means for selectively comparing the pulses retained in said sampling means during the sampling of the pulse train to determine whether there is an occurrence of predetermined digital states of the selected sampled pulses, said pulse comparison occurring repetitively,

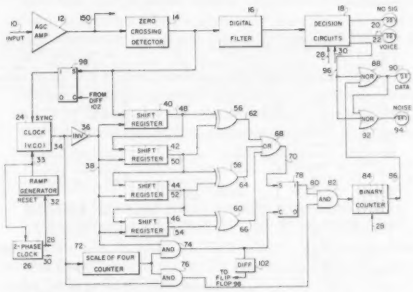
d. means for measuring the occurrences of said predetermined digital states of said selected sampled pulses as determined by said comparing means, and

e. means responsive to said measuring means for providing an output indicative of the presence of data or noise in the communication line as determined by a predetermined magnitude of occurrences of predetermined digital states of said selected sampled pulses.

3,927,260
SIGNAL IDENTIFICATION SYSTEM

Robert M. Amundson, Bluefield, W. Va., and Robert M. Brown, Woodbridge, Va., assignors to Atlantic Research Corporation, Alexandria, Va.

Filed May 7, 1974, Ser. No. 468,007
Int. Cl.² H04M *3/22*
U.S. Cl. 179—1 MN **10 Claims**



1. A system for distinguishing between noise and data signals in a communication line comprising:

a. means for providing a pulse train in response to excursions from a predetermined amplitude level in the signals applied to said communication line,

b. means for sampling the pulse train at a varying rate and retaining temporarily the pulses which are sampled,

c. means for selectively comparing the pulses retained in said sampling means during the sampling of the pulse train to determine whether there is an occurrence of predetermined digital states of the selected sampled pulses, said pulse comparison occurring repetitively,

d. means for measuring the occurrences of said predetermined digital states of said selected sampled pulses as determined by said comparing means,

e. means responsive to the signal in the communication line for detecting the energy contained in said signals at a plurality of spaced frequencies in the frequency band of the data signals,

f. means for comparing the level of the detected energy with a predetermined energy level, and

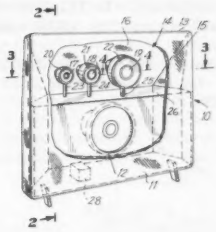
g. means responsive to said measuring means and said energy level comparing means for providing an output indicative of the presence of data or noise in the communication line as determined by a predetermined magnitude of occurrences of predetermined digital states of said selected sampled pulses and a predetermined energy level in said detected energy.

3,927,261
MULTIPLE DRIVER DYNAMIC LOUD SPEAKER

Jon G. Dahlquist, 500 East 85th St., New York, N.Y. 10028

Continuation-in-part of Ser. No. 310,535, Nov. 29, 1972, Pat. No. 3,824,343. This application May 14, 1974, Ser. No. 469,767
Int. Cl.² H04R *1/02*
U.S. Cl. 179—1 E **7 Claims**

1. A multi-driver dynamic loud speaker assembly comprising a frame including an acoustically transparent front face, an enclosure within said frame, a base radiator transducer mounted within said enclosure, at least two additional direct radiator dynamic transducers positioned within said frame, each said dynamic transducer having acoustically associated therewith a baffle member supported within said frame externally of said enclosure, said baffle members being substantially completely surrounded by free space, the effective dimension of each said baffle member measured in a direction normal to the radiating axis of its acoustically associated transducer being not greater than about one half of the wave length of a sound wave at the frequency of the lower nominal crossover frequency of the signal fed to the transducer acoustically associated with said baffle, the area within said frame rearwardly of said at least two transducers being substantially

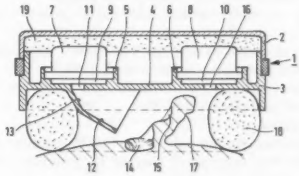


free of sound reflective surfaces facing the front of said loud speaker assembly, and a frequency divider network means for dividing the electrical signals fed to said loud speaker assembly into at least three discrete frequency bands, and applying an appropriate said band to each said transducer.

3,927,262
HEADSET FOR REPRODUCING QUADRAPHONICALLY RECORDED INFORMATION

Helmut Goeckel, Liebenau-Weser, Germany, assignor to Neckermann Versand KGaA, Frankfurt am Main, Germany

Filed June 11, 1974, Ser. No. 478,378
Claims priority, application Germany, June 12, 1973, 2329851
Int. Cl.² H04R *1/10, 5/00*
U.S. Cl. 179—1 GQ **12 Claims**



1. A headset for accurately reproducing quadraphonically recorded information, said headset including headset earpieces, acoustic transmitters for respectively the front sound and the rear sound being located in each said headset earpiece, a supporting wall having a sound opening of predetermined configuration, said wall covering said transmitters, and the earpiece including a rim, a cushioned ring being located on said rim and having a depth such that when the headset is in position on the head of a wearer, the ear occupies its unchanged natural position on the head, characterized in that the supporting wall includes two acoustic exit orifices spaced apart in predetermined relationship, but equidistant from the auditory canal opening of the ear, said orifices being of dissimilar sizes, the front orifice being associated with the front acoustic transmitter whilst the slightly larger orifice is associated with the rear acoustic transmitter; a mounting being provided in each of the two acoustic transmitters so as to act as a pressure chamber, on the supporting wall proximate the acoustic exit orifice for the front sound there being formed an acoustic guide for directing this sound onto the auditory canal of the ear; and the acoustic exit orifice of the rear acoustic transmitter being arranged at a point on the supporting wall so

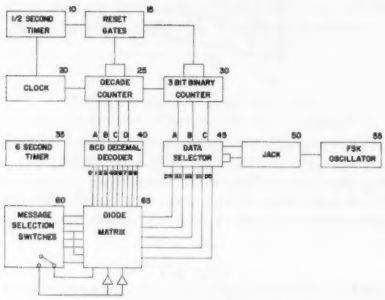
that the rear sound is directed into the zone between the cushioned ring and the rear of the auricle.

3,927,263

PROGRAMMABLE FREQUENCY-SHIFT-KEYING ACOUSTIC TRANSMITTER TO TRANSMIT REPEATED BIT DIGITAL MESSAGE VIA TELEPHONE LINES

Richard D. Fretwell, Grove City, Ohio, assignor to MI² Columbus, Ohio

Filed Mar. 21, 1973, Ser. No. 343,207
Int. Cl.² H04M 11/06
U.S. Cl. 179—2 DP **9 Claims**



1. A programmable acoustic transmitter operable to transmit a repeated digital message over conventional telephone lines into a digital computer using audio frequency-shift-keying transmission techniques, comprising:

a first timing circuit operable to apply power to said transmitter for a fixed period of time,

a clock generator for generating a predetermined bit per second baud rate with logic clock pulses,

a decade counter having said clock pulses connected thereto,

a decimal decoder having the two state logic pulses from said decade counter connected thereto,

a 3 -bit binary counter incremented one count per 10 clock pulses of said decade counter,

a diode matrix,

a data selector having said 3-bit binary counter and said diode matrix connected thereto to generate said mark signal and a space signal,

an oscillator connected to the output of said data selector to generate a frequency signal indicative of a mark and a space signal for transmission on said telephone lines,

said diode matrix having the outputs of said decimal decoder connected thereto for determining the bit pattern of said transmission having a first vertical column of diodes grounded during each count of said clock and a horizontal row of diodes connected to said data selector during ten of each of said clock pulses,

a plurality of switches connected to said diode matrix for programming certain ones of said bits,

reset means for resetting said counters.

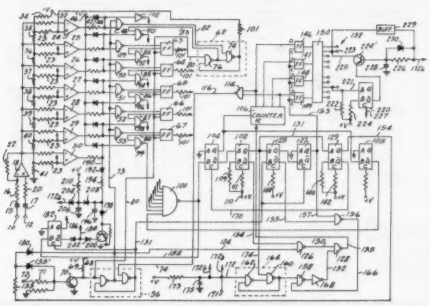
3,927,264

DIAL PULSE DETECTOR AND METHOD

Leonard A. Fish, 21 W. Goethe, Chicago, Ill. 60601; Harvey A. Brodsky, 9440 Lincolnwood Drive, Evanston, Ill. 60203, and Bruce A. Weitzel, 8315 Rte. 53, Woodridge, Ill. 60515

Filed Aug. 17, 1973, Ser. No. 389,340
Int. Cl.² H04M 11/06, 11/10
U.S. Cl. 179—2 A **23 Claims**

1. For use with a remote control device for controlling electrically operated apparatus, using a telephone transmission line interconnected between said electrically operated apparatus and a dial-type telephone instrument, said transmission line constituting an a.c. coupling between said device and said instrument while isolating the d.c. potential of said transmission line at said instrument from said device, the combination comprising: detecting means including means for establishing a series of different discrete threshold levels and a plurality of detector means, one for each said discrete level, for separately detecting on said transmission line the presence of dial pulses generated by a dial-type telephone instrument



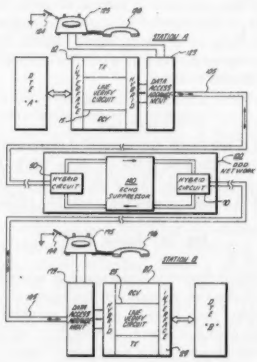
exceeding any of said discrete levels, in response to an instantaneous potential on said line of greater than a discrete level, counting means for counting the number of said pulses within a train of said pulses, output means for manifesting one of a plurality of output signals in response to the number of pulses in said train, and means connected to said output means and responsive to one of said output signals for disabling the detector means for the discrete levels below the highest discrete level which was exceeded during the counted train of pulses.

3,927,265

DATA MODEM HAVING LINE VERIFICATION AND AUTOMATIC DISCONNECT FEATURES

Charles W. Roedel, Miami Shores, and Richard Borysiewicz, Miami, both of Fla., assignors to Milgo Electronics Corporation, Miami, Fla.

Filed Jan. 31, 1974, Ser. No. 438,386
Int. Cl.² H04M 11/06
U.S. Cl. 179—2 DP **18 Claims**



1. In a data communication system wherein a call is placed through a direct distance dialed network, which call seeks to establish a telephone line which includes echo suppressors between a first and second data modem adapted for two-wire/-

half-duplex operation, line verification circuitry for said modems which comprises:

first tone generating means at said first modem emitting a first unique tone for disabling the echo suppressors in said telephone line;

means at said second modem enabled by said first tone being received for a predetermined time duration sufficient to disable said echo suppressors, for emitting a second tone; said second tone being distinct from said first tone, and characterized as incapable of disabling said echo suppressors but capable of transmission through said telephone line when said echo suppressors are disabled; and

means at said second modem responsive to the enablement of said second tone emitting means for indicating that a two-way telephone line with disabled echo suppressors has been established between said first and second modems.

3,927,266

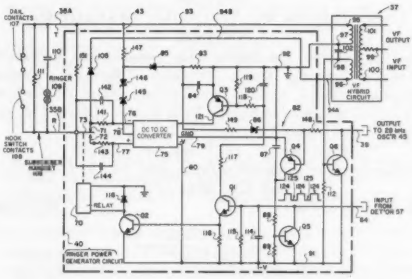
RINGER POWER GENERATOR CIRCUIT FOR SUBSCRIBER CARRIER STATION TERMINAL

James A. Stewart, Menlo Park, and Neale A. Zellmer, Belmont, both of Calif., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 16, 1974, Ser. No. 433,984

Int. Cl.[2] H04J *1/14*

U.S. Cl. 179—2.5 R **30 Claims**



1. A ringer power generator circuit for use in a subscriber carrier telephone system comprising a carrier subscriber station terminal that includes a carrier subscriber handset, the system producing pulses of station terminal ringing signal at the carrier subscriber station terminal in response to a central office ringing signal wherein a cycle of the station terminal ringing signal comprises a ringing period including a series of pulses of ringing voltage followed by a silent period during which a constant voltage is present and these ringing pulses are absent and including a two-wire drop associated with the carrier subscriber handset and a VF hybrid circuit of the carrier subscriber station terminal; one drop wire being connected between one of the tip and ring leads of the handset and a first drop side lead on the hybrid circuit; said ringer power generator circuit requiring only a two-wire drop for connection to a handset and comprising:

first means for producing both positive and negative DC ringer voltages on associated output lines thereof, the magnitudes of said ringer voltages being greater than that of the pulses of ringing voltage;

second means which is a control means responsive to the ringing pulses for causing said first means to produce said ringer voltages throughout a ringing period of a ringing cycle;

third means for coupling one of the positive and negative output lines of said first means through the other drop wire to the second drop side lead on the hybrid during the absence of a station terminal ringing signal, said third means decoupling the hybrid from the one output line of said first means during generation of a ringer voltage thereby;

fourth means responsive to operation of said second means for alternately electrically connecting the positive and negative ringer voltage output lines of said first means to the other one of the tip and ring leads of the handset during and between ringing pulses of a ringing period received from the central office for energizing a ringer of the handset; said fourth means continuously electrically connecting the other one of the tip and ring leads of the handset to the one output line of said first means except during a ringing period; and,

fifth means which is a ring trip means responsive to a transient signal on the drop wires for sensing an off-hook condition in the handset for initiating ring trip and for de-energizing said first means.

3,927,267

TIME DIVISION SWITCHING SYSTEM OF THE "TIME-PACE-TIME" TYPE

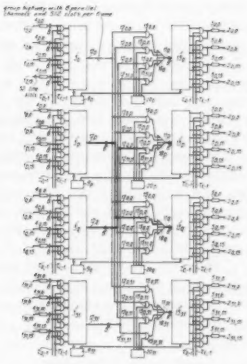
Paul Voyer, Rue des Carrieres, La Clarte, 22700 Perros-Guirec; Jean-Marc B. Pitié, 106, Rue Blaise pascal, 86300 Poitiers; Olivier F. Louvet, 82, Residence Corlay, 22300 Lannion, and Alain Y. Roche, 41, Rue du Sergent L'Heveder, 22700 Perros-Guirec, all of France

Filed Apr. 8, 1974, Ser. No. 458,881

Claims priority, application France, Apr. 6, 1973, 73.12517

Int. Cl.[2] H04J *3/00*

U.S. Cl. 179—15 AT **4 Claims**



1. A time division switching system of the time-space-time division type comprising:

a plurality of incoming time division switching networks;

a plurality of outgoing time division switching networks;

a plurality of incoming time division multiplex circuits divided into identical incoming multiplex circuit groups respectively connected to the inputs of said incoming time division switching networks, each of said incoming multiplex circuits defining incoming multiplex circuit time slots;

a plurality of outgoing time division multiplex circuits divided into identical outgoing multiplex circuit groups respectively connected to the outputs of said outgoing time division switching networks, each of said outgoing multiplex circuits defining outgoing multiplex circuit time slots;

said incoming and outgoing time slots having a given duration and conveying P.C.M. words having a given number of bits;

incoming time division group highways connected to the outputs of said incoming time division switching networks:

outgoing time division group highways connected to the inputs of said outgoing time division switching networks; said incoming and outgoing group highways respectively defining incoming group highway time slots and outgoing group highway time slots conveying said P.C.M. words;

an incoming buffer store in each of said incoming time division switching networks adapted for having stored therein P.C.M. words;

means for cyclically transferring the P.C.M. words conveyed by said incoming multiplex circuit time slots into words of said incoming buffer stores permanently associated with said incoming multiplex circuit time slots;

an outgoing buffer store in each of said outgoing time division switching networks adapted for having stored therein P.C.M. words;

means for cyclically transferring the P.C.M. words stored in said outgoing buffer stores into outgoing multiplex circuit time slots permanently associated with said outgoing buffer store words;

a space division switching network having inputs and outputs respectively connected to said incoming and outgoing time division group highways and including gate means for selectively connecting the concomitant time slots in each incoming and each outgoing group highway; and

a single control store means for, during a first time slot, transferring a first P.C.M. word stored in a word of a first incoming buffer store permanently associated with a first incoming multiplex circuit time slot into a time slot of a first incoming group highway, enabling the gate means connecting said first incoming group highway time slot to a first outgoing group highway time slot and transferring the first P.C.M. word conveyed in said first outgoing group highway time slot into a word of a first outgoing buffer store permanently associated with a first outgoing multiplex circuit time slot and, in a second time slot following said first time slot, transferring a second P.C.M. word stored in a word of a second incoming buffer store permanently associated with a second incoming multiplex circuit time slot into a time slot of a second incoming group highway, enabling the gate means connecting said second incoming group highway time slot to a second outgoing group highway time slot and transferring the second P.C.M. word conveyed in said second outgoing group highway time slot into a word of a second outgoing buffer store permanently associated with a second outgoing multiplex circuit time slot.

3,927,268
SPEECH PREDICTIVE ENCODING COMMUNICATION SYSTEM

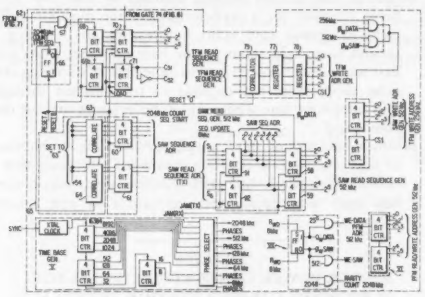
Joseph A. Sciulli, Derwood; Samuel Joseph Campanella, Gaithersburg, and Rene Costales, Rockville, all of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Continuation of Ser. No. 139,106, April 30, 1971, abandoned. This application Feb. 28, 1973, Ser. No. 336,589
Int. Cl. H04j *3/04*
U.S. Cl. 179—15 BW **16 Claims**

1. In a digital communications system wherein information from a maximum number (M) of voice circuits at a transmitting station may be transmitted to a receiving station via a transmission path of given power level, bit rate and bandwidth, apparatus for enable the transmission of information from a number (N) greater than said maximum number (M) of voice circuits over said transmission path comprising:

a. means at said transmitting station for periodically sampling the amplitude of voice signals on each circuit of said N voice circuits;

b. means for comparing for each of said N circuits, a present amplitude sample with a prior amplitude sample which had been transmitted to said receiving station, said comparing means generating N signals in response to said comparisons and storing said N signals as a control word;

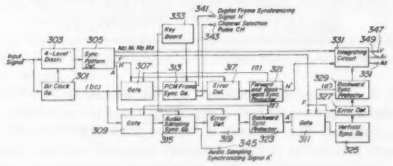


c. means for generating a transmission frame comprising a digital representation of those present amplitude samples which differ from the corresponding prior amplitude samples by a predetermined amount and said control word from said comparing means.

3,927,269
TIME DIVISION MULTIPLEXING TRANSMISSION SYSTEM

Takehiko Yoshino, Yokohama; Akio Yanagimachi, Kawasaki; Takashi Uehara, Inagi; Teruhiro Takezawa, Komae; Masaaki Fukuda, Kodaira, and Tatsuo Kayano, Hachioji, all of Japan, assignors to Nippon Hoso Kyokai Hitachi Ltd. and Hitachi Electronics Ltd., both of Tokyo, Japan

Filed Dec. 21, 1973, Ser. No. 427,219
Claims priority, application Japan, Dec. 29, 1972, 48-3227
Int. Cl.[2] H04J *3/06*
U.S. Cl. 179—15 BS **23 Claims**



1. A time division multiplexing transmission system for transmitting video signals and a plurality of channels of PCM-TDM audio signals alternately, said video and audio signals being divided into video and audio frames, each of which has an equal time duration of a predetermined unit frame period and the video and audio signals being transmitted in a sequence of one video frame and subsequently first and second audio frames, said transmission system comprising at a transmitter end

means for producing video signals under control of horizontal and vertical synchronizing signals having predetermined periods, respectively;

a gate means for alternately passing said audio and video signals at a time rate of a given integer ratio;

a digital synchronizing signal generator for producing audio and video digital synchronizing signals which are composed of a synchronizing information signal having a first pulse chain of a given repetition frequency and of audio and video control signals, respectively, each having a second pulse chain, the pulses of said first and second pulse chains appearing at given time slots, said audio and video digital synchronizing signals being produced at the video signal period, said synchronizing information signal of the given repetition frequency being of common waveform in both of

the audio and video frame periods, and the contents of said audio and video control signals, both of which are produced in the video signal period, being different from one another;

first and second PCM multiplexing means for receiving respective groups of audio channel signals, each receiving half of said plurality of channels of audio signals, and for multiplexing said groups of audio channel signals in time division in the form of PCM signals, respectively, so as to form first and second signal series of PCM-TDM signals, respectively, each signal series containing a plurality of PCM frames, each of which has a PCM frame period equal to an integer ratio of the predetermined period of the horizontal synchronizing signal and includes a plurality of PCM time slots to which said audio channel signals are allotted interruptedly in a predetermined PCM time slot sequence in which a real signal to be reproduced directly and a memory signal to be reproduced after temporary storage are presented alternately, under control of a PCM synchronizing signal having a period equal to an integer ratio of the predetermined period of the horizontal synchronizing signal;

first and second delay means, having first and second delay times equal to first and second integer multiples of said unit frame period, respectively, for delaying said first and second series of PCM-TDM signals, respectively;

an electronic switching means coupled to said first and second PCM multiplexing means, changeable alternately at every frame period, for selectively deriving said first and second series of PCM-TDM signals therefrom;

first memory means, coupled to said first delay means, for storing the delayed first series of PCM-TDM signals during a time duration equal to an integer multiple of said PCM frame period and for reading out the delayed first series at a first repeating interval of the time slot during every first PCM synchronizing period within the PCM frame periods;

second memory means, coupled to said second delay means, for storing the delayed second series of PCM-TDM signals during a time duration equal to said integer multiple of said PCM frame period and for reading out the delayed second series at a second repeating interval of said time slot during every second PCM synchronizing period within the PCM frame periods;

third memory means, coupled to said switching means, for storing either one of the first or second series of PCM-TDM signals selectively derived from said switching means during a time duration equal to an integer multiple of said PCM frame period at a third repeating interval of said time slot during every third PCM synchronizing period within the PCM frame periods, so as to change said PCM time slot sequence in which a group of real signals and a group of memory signals are gathered separately;

third multiplexing means, coupled to said first, second and third memory means, for multiplexing read out signals therefrom together with said audio and video digital synchronizing signals;

and said transmission system further comprises at a receiver end

first means for extracting said pulse chain having the given repetition frequency from said synchronizing information signal of the common waveform inserted in multiplexed audio and video information signals which are transmitted alternately in said sequence and for producing clock pulses having a repetition frequency which is equal to said repetition frequency of said extracted pulse chain;

second means for extracting said audio and video control signals on the basis of the reproduced clock pulses;

means for forming audio and video synchronizing signals, respectively, from the reproduced clock pulses, said audio and video synchronizing signals and said extracted audio and video control signals being collated to each other and said means for forming said audio and video synchronizing signals being controlled by a collation output so as to produce said audio and video synchronizing signals, respectively, in synchronism with a transmitted signal, and said audio and video information signals being reproduced by means of the formed audio and video synchronizing signals; and

means for reproducing an audio information signal divided at the audio signal period from said multiplexed audio information signal divided at said video signal period by rearranging the time positions of the time slots in said multiplexed audio information signal.

3,927,270

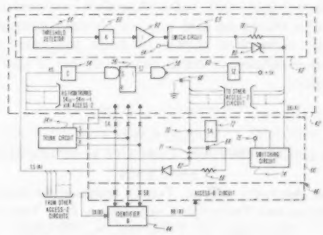
AUTOMATIC NUMBER IDENTIFICATION HAVING FOUR-PARTY DETECTION

Gordon H. Davis, Canandaigua, and Klaus Joehler, Penfield, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed June 26, 1974, Ser. No. 483,478

Int. Cl.² H04Q *3/74*

U.S. Cl. 179—17 A **4 Claims**



1. In a telephone system having a central office, a plurality of two-conductor subscriber lines connected to said central office, first and second subscriber stations connected to one of said plurality of subscriber lines, an outgoing trunk circuit in said central office, and a sleeve lead in said central office associated with said one subscriber line, apparatus for automatically determining a directory number of one of said subscriber stations off-hook initiating a call, comprising:

A. a first unidirectional current device in said first station connected between ground and said one line when said first station is off-hook;

B. a second unidirectional current device in said second station connected oppositely poled of said first unidirectional current device between ground and said one line when said second station is off-hook;

C. a plurality of number elements, two of said number elements associated on a one-to-one basis with said first and second subscriber stations, said two number elements connected to said sleeve lead; and

D. an identifier unit including:

1. a plurality of directory number digit buses, said plurality of number elements each so connected through isolation means to said digit buses that a signal issuing from any one of said number elements appears simultaneously on preselected ones of said digit buses to form signals representative of a unique directory number associated with said any one number element,

2. a pulse detector connected to each of said digit buses,

3. a pulse generator connected through said trunk circuit to said sleeve lead,

4. a control means,

5. a party detector circuit including

a. means responsive to said control means for shorting together the two conductors of said one subscriber line during a first time period,

b. first means connected through said trunk circuit to said one subscriber line in response to said control means during a first portion of said first time period for detecting current through said first unidirectional device when said first subscriber station is off-hook,

said first detecting means unresponsive to said second subscriber station off-hook,

c. second means connected through said trunk circuit to said one subscriber line in response to said control means during a second portion of said first time period for detecting current through said second unidirectional device when said second subscriber station is off-hook, said second detecting means unresponsive to said first subscriber station off-hook,

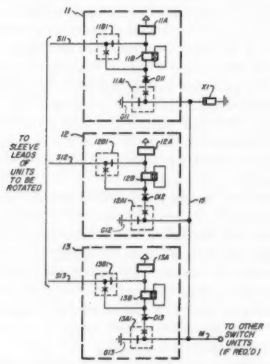
d. means responsive to said first and second detecting means, respectively, during said first and second portions of said first time period for storing an indication of current detected in said one subscriber line, and

6. means responsive to said storage means during a second time period for disabling said number element associated with said subscriber station on-hook, said pulse generator responsive to said control means during said second time period to apply a pulse to said sleeve lead, said pulse detectors responsive to said pulse traversing said number element associated with said subscriber station off-hook to generate signals representative of the directory number of said off-hook station.

3,927,271
SEQUENCE CONTROL CIRCUIT FOR TELEPHONE SYSTEMS

Generoso Acevedo, Milan, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,354
Int. Cl.² H04M 3/22
U.S. Cl. 179—18 AB **5 Claims**

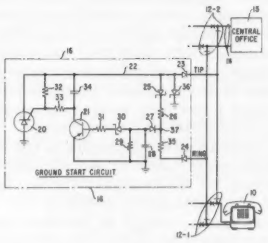


1. A sequence control network for plural switches of a group within a telephone system, said network comprising a plurality of control units, each representing one of said switches, a first lead in each of said units over which the switch may be tested for availability and seized, a first and a second relay in each unit, said first relay of a unit responsive to seizure of said unit for enabling a path to the second relay of said unit, a source of potential at each unit of said group, a common lead from the potential source to all said units, means in a unit responsive to operation of the first relay of that unit for disconnecting said potential source from said common lead, and means for completing a path through any idle one of said units for operation of an enabled second relay of a busy unit for holding said second relay operated to artificially busy said unit, said disconnecting means of a last idle one of said units opening the path to the second relay of all other units to release all second relays of said units.

3,927,272
AUTOMATIC CIRCUIT FOR PROVIDING EMERGENCY GROUND START SIGNALS ON PBX TRUNKS

Glen Lee Bloxham, Murray, and Don Charles Wells, Midvale, both of Utah, assignors to American Telephone and Telegraph Co., New York, N.Y.

Filed June 19, 1974, Ser. No. 480,726
Int. Cl.² H04M 7/00
U.S. Cl. 179—18 AD **15 Claims**



1. In a private branch exchange telephone system arranged for connecting a station directly to a central office trunk for providing outward emergency telephone service during trouble periods of the private branch exchange, the invention comprising circuitry connected to said trunk for notifying a central office of a request for service from said station, said circuitry comprising

timing means operated in response to a request for service from said station for generating a prescribed time interval, and

means responsive to said operated timing means upon an expiration of said time interval for applying a start signal to said trunk to inform the central office of the request for service.

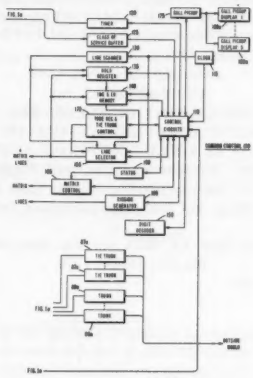
3,927,273
JUNCTOR MEMORY

Uwe A. Pommerening, Webster, and Glenn L. Richards, Caledonia, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed June 13, 1974, Ser. No. 478,960
Int. Cl.² H04Q 3/56
U.S. Cl. 179—18 J **10 Claims**

1. In an electronic private automatic branch exchange having a plurality of line circuits and junctors, switching means for selectively connecting one or more line circuits to a selected junctor, a digit decoder, a hold register and a line selector, the improvement consisting of a junctor memory system comprising a memory having a plurality of storage locations, clock means connected to said memory for sequentially scanning said storage locations during respective junctor times, gating means for selectively gating data to said memory from a selected one of said digit decoder, hold register and

line selector, logic control means responsive to said clock means and selected command signals for actuating said gating

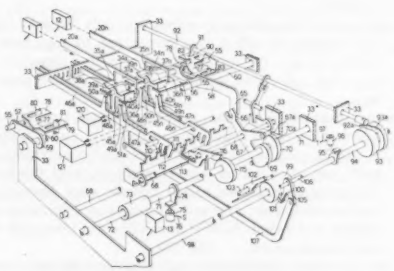


means, and means responsive to the data stored in said memory for controlling said switching means.

3,927,274
CONTROL FOR PRINTING AND SERVICE FUNCTIONS OF AN ACCOUNTING MACHINE

Adriano Zambolin, Ivrea, and Gianfranco De Falco, Samone, both of Italy, assignors to Ing. C. Olivetti & Co., S.p.A., Ivrea, Italy

Filed June 21, 1974, Ser. No. 481,558
Claims priority, application Italy, July 12, 1973, 69083/73
Int. Cl.[2] B41J *5/30, 5/44*
U.S. Cl. 197—19 **9 Claims**

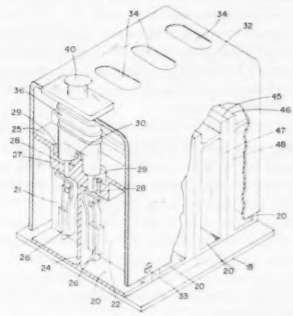


1. Apparatus for governing the printing and service functions for an accounting machine and the like, comprising:
a. a plurality of elements for decoding in succession code combinations,
b. a printing mechanism for printing characters,
c. an actuating mechanism for actuating said service functions according to corresponding code combinations, and
d. a switching device controlled by an element of said plurality of elements for switching the following code combination selectively to said printing mechanism or to said actuating mechanism.

3,927,275
TELEPHONE ISOLATION JACK PANEL

James C. Deitch, Bloomington, and Lawrence A. Robert, Minneapolis, both of Minn., assignors to Magnetic Controls Company, Minneapolis, Minn.

Filed Nov. 5, 1974, Ser. No. 520,964
Int. Cl.[2] H04Q *1/02*
U.S. Cl. 179—97 **5 Claims**

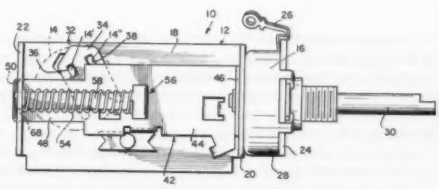


1. A telephone jack panel for use in telephone circuits where high voltage may be present comprising in combination:
a plurality of jacks;
a base;
a plurality of electrically insulating jack support means on said base, each of said support means including at least one cavity for holding the jack, said support means completely surrounding the jack on top, bottom, and sides except for one side, the missing side allowing the cavity to open in a direction away from the other jack cavities so as to provide maximum electrical isolation between the jacks;
an electrically insulating cover enclosing said jack support means and closing said one side, said cover spaced from the entrance ends of said jacks in said support means, and said cover having a plurality of holes aligned with the entrance ends of the jacks, said jack panel adapted to receive insulated plugs which plugs are shaped to fit through the holes in the cover and extend into the entrance ends of the jacks.

3,927,276
SWITCH ASSEMBLY WITH LIMIT STOP STRUCTURE ALLOWING ALTERNATE MAKE AND BREAK OPERATIONAL SWITCH STATES

Ellis P. Lipp, Frankfort, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed May 3, 1974, Ser. No. 466,621
Int. Cl.[2] H01H *9/20;* **H01C** *10/36*
U.S. Cl. 200—327 **4 Claims**



1. A switch assembly comprising:
a. a frame,
b. a switch carried by said frame,
c. a pivotal switch actuator carried by said frame and connected to said switch to selectively actuate same,

d. a slider slideably carried by said frame and engaging said pivotal switch actuator,
e. shaft means connected to said slider to slideably move same,
f. a spring guide slideably carried by said frame and connected to said slider,
g. a slot in the shape of a parallelogram provided in said slider,
h. a coil spring surrounding said spring guide and biased between said frame and a tang extending from said spring guide and engaging said slot, and
i. a bar pivotly mounted between ends of said bar on said frame, and first and second V-shaped notches at opposed ends of said bar engaging first and second tangs extending from said slider and disposed to provide a space for said bar to pivot therebetween,

movement of said slider from a first position in a first direction engaging said first V-shaped notch with said first tang to pivot said bar into an interference path with said first tang, movement of said slider in a second opposite direction engaging said second tang with said second V-shaped notch to lock said slider in a second position, subsequent movement of said slider in said first direction engaging said first tang with said first V-shaped notch to pivot said bar and release said second V-shaped notch from said second tang, said pivoting of said bar permitting said slider to return to said first position.

3,927,277
DISTRIBUTING FRAME

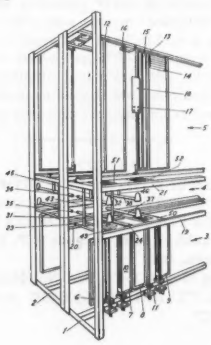
Oscar Wuyts, Beveren-Waas; Felix Joanna Petrus Carpentier, Ekeren, and Ludovicus Josephus Albertus Wouters, Wijnegem, all of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 6, 1974, Ser. No. 467,440

Claims priority, application Netherlands, May 10, 1973, 7306556

Int. Cl.[2] H04Q *1/14*

U.S. Cl. 179—98 **5 Claims**



1. A distributing frame for a telecommunication exchange of the type having a plurality of first and second groups of terminals, together with a jumpering section containing a series of jumper wires for interconnecting said first and second groups of terminals, the improvement comprising:

first jumper wire separating means located between said first and second groups of terminals within said jumpering section and including a plurality of first subsections defined by a first plurality of interconnecting vertical and horizontal support members, each of said first subsections located one over the other in the vertical plane and separated from each other by means of at least one of said horizontal support members; and

second jumper wire separating means with said jumpering section said second separating means including a pair of second subsections defined by a second plurality of vertical support members and extending in a plane perpendicular to each of said first subsections, one of said second subsections being larger than the other of said second subsections, and separated therefrom said other second subsection by at least one of said second plurality of vertical support members,

whereby said jumper wires located within said jumpering section are accessible when a pair of said distributing frames are connected together.

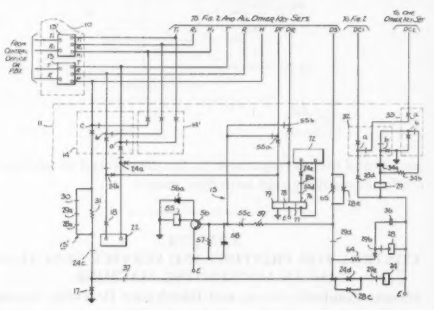
3,927,278
DIRECT-STATION-SELECTION INTERCOMMUNICATION AND AUTOMATIC HOLDING CIRCUIT IN A KEY TELEPHONE SYSTEM

Fumio Tsutsumi, Yokohama, Japan, and Stephen Kerman, Merrick, N.Y., assignors to Nippon Tsu Shin Kogyo K.K., Kanagawa, Japan and TIE/communications, Inc., Stamford, Conn.

Filed Mar. 23, 1973, Ser. No. 344,219

Int. Cl.[2] H04M *1/00*

U.S. Cl. 179—99 **4 Claims**



1. A circuit for a first key telephone set in a key telephone system having a plurality of line keys for connecting the transmission network thereof to a like plurality of office line circuits wherein the improvement comprises, in combination,

a pair of intercom line conductors;

at least one intercom station selection key associated with at least one other key telephone set having a transmission network;

means, including first and second normally released relays, for holding an office line connected to said first key telephone set and for supplying a calling signal to said other key telephone set upon operation of said intercom key;

means, responsive to said operation of said key, including normally released third and fourth relays, for establishing a talking path between said transmission networks over said pair of intercom line conductors, said third relay operating in response to the release after operation of said second relay, and said fourth relay operating in response to a switch hook status indication from said other key telephone set;

first capacitor means connected in series with an operating winding of said first relay;

second capacitor means, including a make contact of said first relay, for storing electrical energy during the period of operation of said first relay; and

means, including a break contact of said first relay, for supplying said electrical energy to an operating winding of said second relay;

the enumerated means being so proportioned and the combination being so constructed and arranged that said first relay operates for a period of time determined primarily by said first capacitor, and said second relay operates for a period of time determined primarily by said second capacitor.

3,927,279
HEARING AID

Kenji Nakamura, Chigasaki; Kunihiko Fukuyama, and Takuo Yamamoto, both of Tokyo, all of Japan, assignors to Rion Kabushiki Kaisha, Kokubunji, Japan

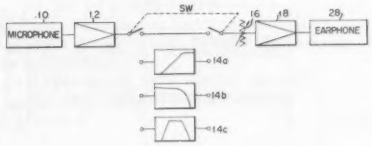
Filed Apr. 24, 1973, Ser. No. 354,145

Claims priority, application Japan, Oct. 16, 1972, 47-103466

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H04R *25/00*

U.S. Cl. 179—107 FD **8 Claims**



1. A hearing aid device comprising in combination, a pair of microphones each picking up acoustic energy to convert it to a corresponding electrical energy, a control generator circuit connected to one of the microphones to generate a control voltage in response to that portion of the electric energy generated by said one microphone having a predetermined frequency spectrum, a first control circuit connected to both the other microphone and to the control generator circuit to decrease the lower frequency portions of the electrical energy from the other microphone in response to the control voltage from the control generator circuit, and a second control circuit connected to the first control circuit and also to the control generator circuit to decrease the higher frequency portion of the electrical energy from the other microphone in response to the control voltage from the control generator circuit, whereby acoustic energy reconverted from the electrical energy has a frequency characteristic suitable for the auditory characteristic of a person having difficulty in hearing.

5. A hearing aid device comprising in combination, a single microphone for picking up acoustic energy to convert it to a corresponding electric energy, a control generator circuit connected to the microphone to generate a control voltage in response to that portion of the electric energy generated by said one microphone having a predetermined frequency spectrum, a first control circuit connected to the microphone and to the control generator circuit to decrease the lower frequency portions of the electric energy in response to the control voltage from the control generator circuit, and a second control circuit serially connected to the first control circuit and to the control generator circuit to decrease the higher frequency portions of the electric energy in response to the control voltage from the control generator circuit, whereby acoustic energy reconverted from the electric energy has a frequency characteristic suitable for the auditory characteristic of a person having difficulty in hearing.

3,927,280
NEGATIVE IMPEDANCE REPEATER

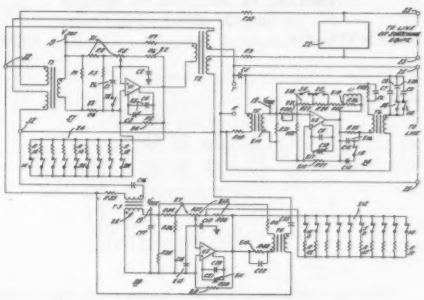
Shanti S. Gupta, Naperville, and Robert G. Pershing, Glen Ellyn, both of Ill., assignors to Wescom, Inc., Downers Grove, Ill.

Filed May 13, 1974, Ser. No. 469,643

Int. Cl.² H04B *3/18, 3/36*

U.S. Cl. 179—170 G **21 Claims**

1. A negative impedance repeater for use with non-loaded transmission facilities comprising in combination, a gain unit having a substantially constant image impedance, impedance corrector means shunted across the transmission facility for correcting the impedance thereof to match the image impedance of the gain unit, said impedance corrector means including amplifier means having feedback paths at least one of which is frequency dependent for establishing a crossover frequency and lowering the apparent impedance of the facility below said crossover frequency and increasing the apparent impedance of the facility above said crossover frequency thereby to yield a corrected impedance having a characteristic attenuation vs. frequency slope, said gain unit including means for providing a gain vs. frequency characteristic which complements the corrected attenuation vs. frequency slope.



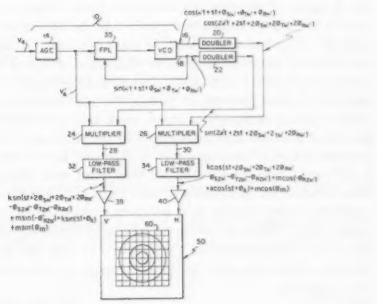
3,927,281
INSTRUMENT FOR MEASURING HARMONIC DISTORTION IN TELEPHONE TRANSMISSION

Frank R. Bradley, 9 Dash Place, Bronx, N.Y. 10463

Filed Dec. 3, 1974, Ser. No. 529,223

Int. Cl.² H04B *3/46*

U.S. Cl. 179—175.3 R **23 Claims**

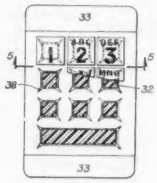


12. An instrument for displaying harmonic distortion in a transmission system by operating on a received signal having test tone and disturbance components therein comprising means for deriving from the received signal a pair of single-frequency quadrature signals whose frequency is that of the test tone multiplied by a harmonic factor of interest, a pair of means each responsive to a respective one of said quadrature signals to extract harmonic information of interest contained in the received signal and for generating a pair of display signals, display means having first and second orthogonal input circuits responsive to the application of signals thereto for generating a display, and a pair of low-pass filter means for coupling a respective one of said display signals to a respective one of said orthogonal input circuits.

3,927,282
BUTTONS FOR ATTACHMENT TO PUSH-BUTTON TELEPHONE KEYS

Harold S. Firstenberg, 131 Townsend St., San Francisco, Calif. 94107

Filed Oct. 18, 1973, Ser. No. 407,533
Int. Cl.² H04M 1/23
U.S. Cl. 179—178 3 Claims



1. For use with keys of the type having a rectangular shape which are positioned on a keyboard in an array of columns and rows with a first gap between the adjacent margins of said keys, a plurality of buttons each having a body having a top and a bottom, said bottom formed with a recess complementary in shape to the upper end of one of said keys, said top being rectangular in plan and dimensioned substantially larger than the tops of said keys so that when said buttons are installed on said keys the distance between adjacent margins of said buttons is substantially less than said first gap, each said top provided with a large, highly visible numeral, the top of each said key being concave and the bottom of said recess being convex with pressure-sensitive adhesive on the bottom of said recess to cause each said button to adhere to an individual key, the recesses in the bottoms of some of said buttons being centered, the recesses in others of said buttons being offset laterally and the recesses in others of said buttons being offset longitudinally, tops of said buttons being wholly exposed and unobstructed by any structure located above said tops of said buttons, the contiguous edges of adjacent buttons being disposed in close proximity to each other whereby the tops of all said buttons when positioned on said entire array of keys are disposed with minimal gaps between buttons, a thin card having dimensions greater than said array of keys, said card being formed with a plurality of substantially rectangular apertures corresponding in number to said buttons, each said button having rectangular sides, each said side formed with a groove of a breadth at least equal to the thickness of said card plus the extent of movement of one of said keys when said key is activated, the grooves on all said sides extending continuously around the periphery of said button, the margins of said apertures being within said grooves, said card being dimensioned larger than said array of keys and being formed with at least one marginal panel for display of information of the character of emergency telephone numbers, advertising matter or the like.

3,927,283
INTERLOCKING BAR ALLOWING OPERATION OF ONE SWITCH ASSEMBLY IN A PLURAL COLUMN, ROW MATRIX SWITCH ASSEMBLY

Isao Kunimine, Kawasaki, Japan, assignor to Nippon Tsu Shin Kogyo K.K., Kanagawa, Japan and TIE/communications, Inc., Stamford, Conn.

Filed Mar. 14, 1973, Ser. No. 341,200
Claims priority, application Japan, Jan. 31, 1973, 48-12877
Int. Cl.² H01H 9/26
U.S. Cl. 200—5 R 1 Claim

1. An interlocking pushbutton key switch mechanism for a key telephone comprising

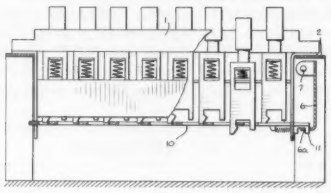
a box shaped mounting frame;

a plurality of switch modules mounted on said frame each module having a plurality of pushbutton keys and associated switching means including printed circuit board means mounted to each of said modules, and said frame;

a horizontally movable interlocking lower bar mounted in each said module and connected to each row of keys;

said interlocking bars being movable in a horizontal direction upon depressing one of said keys in each of said rows, said interlocking bar having a notched portion on one end thereof; and

a rotatably mounted rectangular coupling plate pivotally mounted at one end to said frame and being substantially

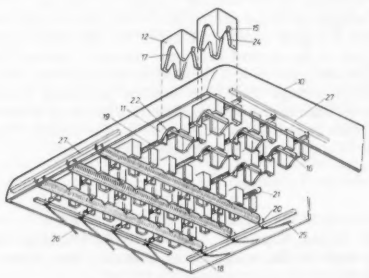


perpendicular to the interlocking bars, said coupling plate having an opening at the other end of said plate, on a portion of said plate projecting out from the coupling plate at a distance below the pivot point of the coupling plate and in juxtaposition to the notched portion of said bars, for engaging the notched portion of each of said interlocking bars so that horizontal movement of one of said bars pivots said coupling plate and causes interlocking horizontal movement of all other rows of keys in substantially the same manner to thereby interlock all the rows of keys.

3,927,284
KEYBOARD SWITCH ASSEMBLY HAVING COIL SPRING CONTACTS PROVIDING POINT CONTACTS ENGAGEMENT

Leif Helmer Anderson, Atvidaberg, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden

Filed Nov. 5, 1974, Ser. No. 521,100
Claims priority, application Sweden, Nov. 7, 1973, 73150955
Int. Cl.² H01H 13/28
U.S. Cl. 200—5 R 9 Claims



1. The combination of a keyboard, a key-operated switch and an electrical circuit comprising at least one elongated resilient member forming a first switch contact, an elongated second switch contact positioned substantially perpendicular to said first switch contact, a stationary support located adjacent to and over said second switch contact, a generally rectangularshaped key provided with a pair of notches on one set of opposed sides of said key and when said key is depressed the upper edges of each of said pair of opposed notches en-

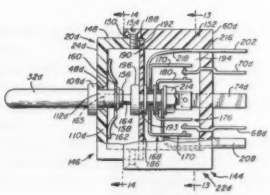
gage said first switch contact on opposite sides of said stationary support and stresses said first switch contact thereagainst whereby the first switch contact is forced into engagement with said second switch contact at two spaced points to thereby close said electrical circuit, said first switch contact additionally functioning as a return spring for said key when the electrical circuit is open.

3,927,285

MULTIDIRECTIONAL SWITCH WITH UNIVERSALLY PIVOT ACTUATOR FOR ACTIVATING PLURAL CIRCUITS

Louis H. Frost, Grand Rapids, and Walter H. Powers, Jackson, both of Mich., assignors to L. H. Frost and Company, Inc., Grand Rapids, Mich.

Filed July 8, 1974, Ser. No. 486,507
Int. Cl.² H01H *21/24, 25/00*
U.S. Cl. 200—6 A **71 Claims**



1. Switch structure for controlling the direction of operation of a plurality of electric motors which comprises,

support means, a plurality of pairs of electric contacts on said support means,

the contacts of each pair being adapted to be connected in current conducting relation to an electric motor,

a control member on said support means selectively movable in a plurality of directions relative to said pairs of contacts,

a positive and a negative terminal mounted for movement with said member and being electrically insulated from each other,

conductors on said support means electrically connected with said terminals and being adapted for connection with a source of electric current,

each of said terminals having a portion adjacent to but spaced from each of said contacts in one position of said control member,

first and second of said portions of each of said positive and negative terminals being engageable respectively with alternate ones of one pair of said contacts responsive to movement of said member in first and second directions with respect to said one position,

third and fourth of said portions of each of said positive and negative terminals being engageable respectively with alternate ones of another pair of said contacts responsive to movement of said member in third and fourth directions with respect to said one position,

said first and third portions being engageable respectively with the contacts of said one pair and other pair responsive to movement of said member in a fifth direction with respect to said one position,

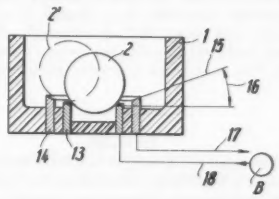
said second and fourth portions being engageable respectively with the contacts of said one pair and other pair responsive to movement of said member in a sixth direction with respect to said one position.

3,927,286

INERTIA TYPE SWITCH HAVING BRIDGING BALL CONTACTOR AND PLURAL, CONCENTRIC CONDUCTIVE RING ARRAY

Artur Föhl, Schelmenwasenstr. 68, 7061 Haubersbronn, Germany

Filed June 11, 1973, Ser. No. 368,972
Claims priority, application Germany, June 13, 1972, 2228683
Int. Cl.² H01H *35/02, 35/14*
U.S. Cl. 200—61.45 R **14 Claims**



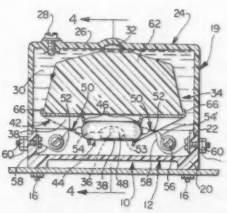
1. An acceleration responsive electric control device in combination comprising a mass inertia element in the form of a ball having a surface of conductive material, a support member having a seat supporting said ball seated thereon, said member comprising a first fixed contact device having a circular internal periphery of substantially less diameter than said ball normally lying in a horizontal plane, the top of said device forming a ring surrounding the lower portion of the ball resting thereon, said contact device having conductive material on its surface to contact the ball in engagement with said ring, a second fixed contact device having a second circular periphery forming a second ring coaxial with said first ring and spaced radially outwardly and upwardly of said first ring, a distance less than the diameter of said ball, and normally lying in a horizontal plane, said second contact device having conductive material on its surface to contact a ball in engagement with said second ring, said ball being displaced from said first ring by acceleration to span the space between said two contact devices and engage said two rings, the lines of contact of said rings engageable by said ball lying in a surface inclined downwardly toward the axis of said rings, so that the ball returns to its seat on said first ring when said acceleration ceases, and means to retain said ball in association with said contact devices.

3,927,287

SENSOR UNIT

Charles E. Hopwood, 1108 Sunnydale Drive, Clearwater, Fla. 33515

Continuation-in-part of Ser. No. 344,196, March 23, 1973, Pat. No. 3,846,748. This application Aug. 2, 1974, Ser. No. 489,516
Int. Cl.² H01H *29/20, 35/14*
U.S. Cl. 200—61.47 **16 Claims**



9. In a signal system for a vehicle, a sensor unit for actuating a signal responsive to movement of the vehicle, the sensor unit comprising, a body adapted to be operatively fixed to the

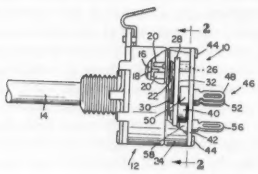
vehicle and including a container and a liquid in said container, said container having a centering concavity for cooperation with the liquid in positioning a centering bubble when leveling the body, a sensor substantially immersed in said liquid and mounted on said body for swinging movement about a generally level axis to permit relative movement between the sensor and said body, said sensor including control means adapted to be connected with a source of electrical power and the signal and operable between a normal first position and a second position for operating the signal, said control means being mounted substantially level with said generally level axis and operable from the first position to the second position responsive to a change of velocity of the vehicle, and said sensor further including retaining means above said axis and retaining said control means in substantially said first position as said body moves relative to said sensor.

3,927,288

ELECTRICAL SWITCH HAVING A MOVABLE CONTACT ROLLING BETWEEN STATIONARY CONTACTS

Jay Utken, and Edgar F. Hauenstine, both of Frankfort, Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Feb. 1, 1973, Ser. No. 328,869
Int. Cl. H01h *1/16*
U.S. Cl. 200—277 **6 Claims**



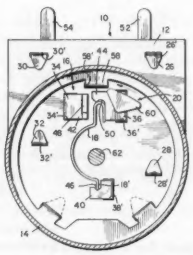
1. In an electrical switch wherein a self-centering round movable contact engages at least three rectangular shaped stationary contacts, two of said contacts disposed in tandem relationship with a space therebetween, the third contact spaced from said first two contacts and overlapping said space, said contacts further being disposed lengthwise directionally substantially parallel to a path of movement of said movable contact, and means rolling said round movable contact between said stationary contacts.

3,927,289

SNAP SWITCH

Edgar F. Hauenstine, Frankfort, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Sept. 12, 1974, Ser. No. 505,464
Int. Cl.² H01H *1/58*
U.S. Cl. 200—284 **4 Claims**



1. A switch assembly comprising;

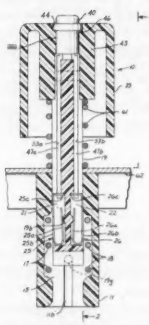
a. a terminal board having opposed surfaces,
b. electrically conductive means providing electrical contact seats at at least three positions,
c. means integral with one of said seats pivotly receiving an end of a switch blade, movement of said blade selectively engaging another end of said blade with one of the other of the remaining two seats,
d. apertures in said terminal board, said electrically conductive means further including tangs extending through selected ones of said apertures and crimped over against the other of said opposed surfaces,
e. electrical terminals electrically connected to electrically conductive means, and
f. actuator means pivoting said switch blade.

3,927,290

SELECTIVELY ILLUMINATED PUSHBUTTON SWITCH

Ronald S. Denley, Woodstock, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Nov. 14, 1974, Ser. No. 523,776
Int. Cl.² H01H *13/14*
U.S. Cl. 200—314 **19 Claims**



1. An electrical pushbutton switch of the type including a stationary housing with a longitudinal passageway formed therein, a plurality of spaced stationary contacts extending across and disposed in at least one array along said passageway, and a reciprocally movable assembly, including a slider adapted for movement within the housing passageway, a pushbutton mounted at the upper end of said slider, and conductor means carried by the slider within said passageway and positioned to engage selective ones of the spaced contacts in response to said slider being moved within the passageway, characterized in that said combination further includes;

at least one channel formed in and extending longitudinally externally along the length of said slider;

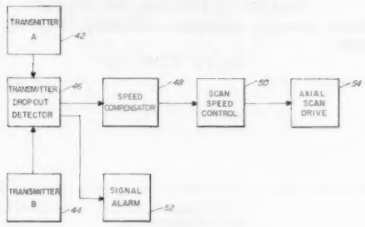
a receiving cavity formed in said pushbutton, and

a light source at least partially mounted within the cavity of said pushbutton, and having at least one elongated lead attached thereto, said lead being dimensioned so as to extending longitudinally within said slider channel, with the free end thereof being conductively coupled to at least an associated portion of said conductor means carried by said slider, and through said conductor means to selective ones of said array of stationary contacts, while another lead attached to said light source is simultaneously conductively coupled to at least one other stationary contact so as to complete circuit continuity to said light source through different selective ones of said array of contacts and said other contact.

3,927,291
REDUCED SPEED COMPENSATOR FOR MICROWAVE HEATING APPLICATOR

Robert A. Peterson, Canton, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 374,832, June 29, 1973, abandoned.
This application June 19, 1974, Ser. No. 480,657
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 R 4 Claims

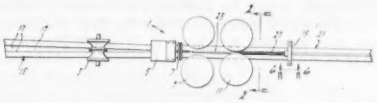


1. Microwave heating apparatus comprising:
an enclosure;
plural interconnected sources of electromagnetic energy;
means for radiating said energy within said enclosure;
means for positioning an article to be heated within said enclosure;
said positioning means having a programmed rate of movement controlled by a speed control electrical circuit to heat said article to obtain a desired temperature profile; and
electrical circuit means including a drop-out detector circuit to detect the failure of at least one of said sources to operate and generate an output signal and a speed compensator circuit energized by said output signal interconnected to said speed control circuit to reduce movement of said article positioning means by a factor commensurate with the reduction of power resulting from said source failure.

3,927,292
WELD BEAD FORM ROLLS

Donald P. Worden, Union Grove, Wis., assignor to Tenneco Inc., Racine, Wis.

Filed Oct. 15, 1974, Ser. No. 514,432
Int. Cl.² B23K 7/08
U.S. Cl. 219—67 11 Claims

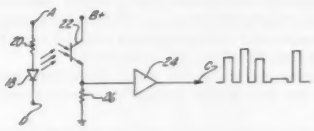


1. In a tube mill for making tubing by forming a skelp from strip metal and welding the edges of the skelp together, the combination of means for continuously moving the strip along a path extending longitudinally of the length of the tubing being formed, heating means for continuously heating the edges of the skelp to be welded together, first pressure means to continuously apply welding pressure to the skelp to weld the edges together into a weld having an outside bead, second continuous pressure means for transversely compressing the outside weld bead into a cross section that is substantially thinner at juncture of the outside bead and the tubing than is the weld, and scarfing means for continuously severing the compressed outside weld bead from the tubing along a plane that is substantially flush with the outer surface of the tubing.

3,927,293
FUNCTION CONTROL CIRCUIT FOR EDM POWER SUPPLY

Oliver A. Bell, Jr., Mooresville, N.C., assignor to Colt Industries Operating Corporation, New York, N.Y.

Division of Ser. No. 251,352, May 8, 1972, Pat. No. 3,825,713.
This application Mar. 5, 1974, Ser. No. 448,351
Int. Cl.² B23P 1/08
U.S. Cl. 219—69 C 20 Claims

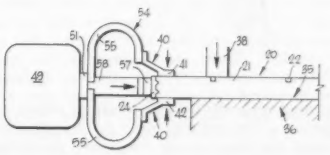


1. In an electrical discharge machining apparatus for machining a conductive workpiece by passing machining power pulses from an electrode tool across a dielectric coolant-filled gap, a servo feed system for providing relative movement between said electrode tool and workpiece as material is removed, said servo feed system including reversible motive means, an electrically energized element operably connected to said motive means for controlling its operation responsive to current flow through said element, means for providing a signal output for said element comprising a light-emitting device connected in series with said gap and effective to provide a light output signal of an energy level magnitude representative of gap current level and hence of gap spacing, and a light responsive device operably linked to said light-emitting device for receiving and converting said light signal to an electrical signal for controlling said electrically energized element and said motive means.

3,927,294
WELDING METAL GRATING ENDS

Peder John Andersen, Brookvale, Australia, assignor to P.M. Andersen Manufacturing Pty. Limited, Brookvale, Australia

Filed Mar. 6, 1974, Ser. No. 448,512
Claims priority, application Australia, Mar. 8, 1973, 2516/73
Int. Cl.² B23K 11/02
U.S. Cl. 219—107 11 Claims



1. A method of welding a transverse end bar to the ends of longitudinal members of a metal grating, wherein the transverse end bar comprises two welding beads, comprising the steps:
a. clamping the longitudinal members near one end of the grating against a grating support surface on a first frame,
b. positioning the end bar welding beads adjacent the clamped ends of the longitudinal members,
c. positioning a first electrode comprising two copper alloy blocks at a first welding locality into firm contact engagement with a said longitudinal member near its clamped end, said blocks having respective flexible jumper leads of equal length and resistance positioned respectively above and below the medial horizontal plane of the end bar

connecting said blocks with a first secondary terminal of a transformer,

d. driving a second electrode against the end bar to bring it into firm welding contact with the end of said contacted longitudinal member, the second electrode having a flexible jumper lead lying in said medial horizontal plane and connecting it with a second secondary terminal of said transformer, said jumper leads between them defining two secondary loops of equal impedance, said electrodes and transformer being carried on a second frame,

e. energizing said transformer to effect resistance welds between the end of that said contacted member only and respective said welding beads of said end bar, while at the same time collapsing the weld metal,

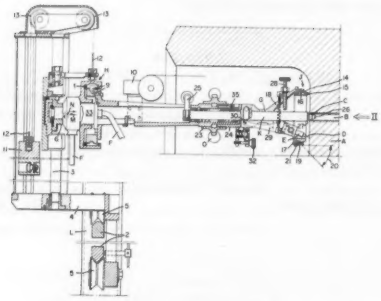
f. releasing the electrodes respectively from engagement with the then welded longitudinal member and end bar, and

g. effecting relative movement between said frames to position the electrodes at a second welding locality, similarly effecting a resistance weld at the second welding locality and straightening any bend in the end bar caused by collapse of weld metal during the previous weld, and repeating until all welds have been effected, by welding the end bar to the longitudinal members one at a time.

3,927,295
WELDING SYSTEM

Joachim Schuster, and Hermann Seien, both of Oberhausen, Germany, assignors to Babcock & Wilcox, Limited, London, England

Filed Feb. 1, 1974, Ser. No. 438,833
Int. Cl.² B23K *9/12*
U.S. Cl. 219—125 R **4 Claims**

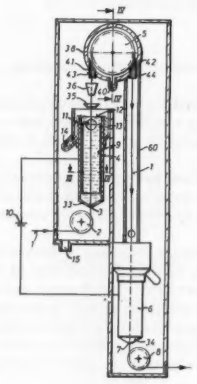


1. A welding apparatus for use in making orbital welds at the junction of a tube and tube sheet and having a rotatable welding head, the improvement comprising means for positively positioning the welding head with respect to the intended welding path, said means including rotatable and stationary members, and each of said members having a bearing surface disposed in spaced surrounding relation to the welding head, one of said surfaces being inclined with respect to the central axis of the rotating member, bearing means interposed between said surfaces, and means for mounting the welding head on said rotatable member, said stationary member having means projecting therefrom for contacting the tube sheet, and said rotatable member including a hollow spindle, a normally retracted centering pin housed in said spindle, means for inserting the pin into said tube when aligning the rotatable member therewith, means for applying pressure through the rotatable member, and means independent of said stationary member and adapted for supporting the rotatable member during alignment and thereafter sustaining the pressure therethrough, said pressure giving rise to a centering action between the rotatable and stationary members while maintaining the projecting means engaged with said tube sheet.

3,927,296
APPARATUS FOR THE HEATING OR ANNEALING OF MATERIALS IN ELONGATED FORM

Heinrich Zettl, Lohnberg, and Klaus Decker, Rehe, both of Germany, assignors to Firma Henrich KG, Horbach, Germany

Filed Nov. 4, 1974, Ser. No. 520,750
Claims priority, application Germany, Nov. 9, 1973, 2356003
Int. Cl.² C21D *9/62*
U.S. Cl. 219—155 **29 Claims**



1. In an apparatus for the heating of aluminum wire and other elongated materials by electrical resistance heating, the combination of first and second electrolyte containers through which the elongated material to be treated is passed, electrode means in each container for making an electrical connection through an electrolyte with the elongated material passing therethrough, means for defining a substantially vertical path for the elongated material through the first and second container, and overflow means on each of said electrolyte containers.

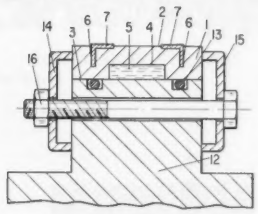
3,927,297
SEALING JAW

Wilhelm Reil, Bensheim-Auerbach, Germany, assignor to Altstädter Verpackungs-Vertriebs GmbH, Pfungstadt am Hintergraben, Germany

Filed July 29, 1974, Ser. No. 492,584
Claims priority, application Germany, Aug. 8, 1973, 2340078
Int. Cl.² H05B *1/00*
U.S. Cl. 219—243 **9 Claims**

1. A sealing jaw comprising a mounting, an electrically insulating, thermally conductive carrier of strip form, the carrier being detachably secured to the mounting, at least one groove in a surface of the carrier, an electrical heating element of angular cross section, a limb of said element being

received in the groove, and the element extending above said surface of the carrier, wherein said one limb of the element is



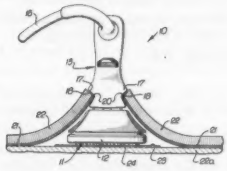
inserted into the groove and clamped fast and substantially immovable therein by a single pressing.

3,927,298

CARPET SEAMING IRON

Earle F. Prater, Long Beach, Calif., assignor to Roberts Consolidated Industries, Inc., City of Industry, Calif.

Filed Apr. 28, 1975, Ser. No. 572,388
Int. Cl.² D06F *75/08*
U.S. Cl. 219—245 **3 Claims**



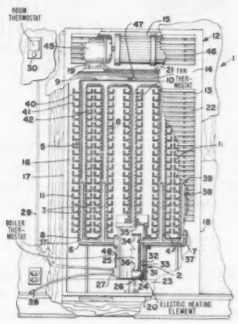
1. In an electric iron for simultaneously heating a heat sensitive adhesive tape and carpet edges to be joined in abutting relation by the tape, the combination of:
   a. elongated, generally rectangular sole plate means being insertable between and movable longitudinally of the tape and the carpet edges;
   b. electrical heating means for heating the upper and lower sides of the sole plate means; and
   c. a dorsal superstructure mounted on the upper side of said sole plate means, and extending upwardly therefrom,
      said superstructure extending a major portion of the length of said sole plate means, from a point adjacent the leading edge of said sole plate means to a point adjacent to the trailing end thereof, and its sides being spaced inwardly of the side edges of said sole plate means,
      said superstructure having on its outer surface a pair of outwardly extending and generally parallel longitudinal ridges spaced upwardly from said sole plate means, each engageable with a carpet edge and limiting upward movement of said edge relative to the iron as the iron is moved longitudinally relative to said edges, and said superstructure including a handle by which the iron may be moved longitudinally relative to such carpet edges.

3,927,299

SELF-CONTAINED ELECTRIC STEAM SPACE HEATING UNIT

Clifford M. Sturgis, 1213 Westmoreland, Colorado Springs, Colo. 80907

Filed Mar. 18, 1974, Ser. No. 452,421
Int. Cl.² H05B *1/00;* **F24H** *3/06*
U.S. Cl. 219—365 **5 Claims**



1. A self-contained closed system steam heating unit comprising:
   a. a boiler unit containing liquid to be vaporized and having inner and outer chambers with communicating passages at lower portions thereof for flow of liquid from the outer chamber to the inner chamber;
   b. a heating element in the boiler and operative to heat the liquid and form steam in the inner chamber;
   c. a radiator unit having a plurality of spaced apart upright tubular risers and an upper manifold connecting upper ends of the risers and communicating therewith;
   d. a lower tubular manifold connecting lower ends of the risers and an upper portion of said boiler outer chamber for communication therebetween;
   e. an upright tubular condenser member having an upper end communicating with the upper manifold in spaced relation to said risers and having a lower end communicating with an upper portion of said boiler outer chamber;
   f. said lower manifold and upright condenser member forming flow passages for condensate to flow from the radiator unit to the outer chamber of the boiler;
   g. an elongate steam discharge pipe having one end communicating with an upper portion of the boiler inner chamber and extending therefrom longitudinally within said lower tubular manifold and having discharge portions extending upwardly in lower portions of each of said risers with each discharge portion having an orifice discharging steam upwardly into the respective riser;
   h. and means moving air around said upper manifold, risers and condenser tube to receive heat therefrom.

3,927,300

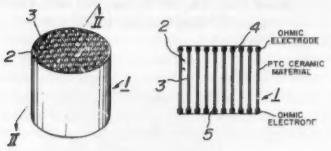
ELECTRIC FLUID HEATER AND RESISTANCE HEATING ELEMENT THEREFOR

Shigetaka Wada, Kuwana, and Noboru Yamamoto, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Mar. 4, 1974, Ser. No. 447,513
Claims priority, application Japan, Mar. 9, 1973, 48-26934
Int. Cl.² H05B *3/14;* **H01C** *7/02;* **F24H** *1/10, 3/04*
U.S. Cl. 219—381 **8 Claims**

1. A heating element consisting essentially of:
   a. a column-shaped honeycomb structural body of electrically conductive ceramic material, said body having a multiplicity of substantially uniform parallel channels extending therethrough with each of said channels being

bounded by a partition wall which is substantially uniform in thickness, said structural body also having a surface-to-volume ratio in the range of 10 to 60 cm^2/cm^3 and having

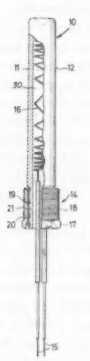


a positive temperature coefficient of electrical resistance;
b. a pair of ohmic electrodes mounted on the opposite surfaces of the body and in electrical contact therewith;
c. Means for feeding fluid through said channels.

3,927,301
ELECTRICAL HEATING CARTRIDGE

Otto Heuel, and Heinz Emmerichs, both of Ludenscheid, Germany, assignors to HASCO-Normalien Hasenclever & Co., Ludenscheid, Germany

Filed Sept. 17, 1974, Ser. No. 506,888
Claims priority, application Germany, Sept. 19, 1973, 2347090
Int. Cl.² H05B 3/06
U.S. Cl. 219—523 **4 Claims**

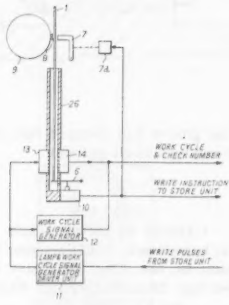


1. A heating cartridge comprising:
a thermally conductive shell having a frustoconical outer surface tapering from a larger end to a smaller end thereof with a conicity on the order of 50:1, said shell being closed at said smaller end and being provided at said larger end with a cylindrically tubular extremity;
a pair of axially spaced-apart, substantially nondeformable annular abutments on the outer surface of said extremity; an externally threaded rigid sleeve freely rotatable on said extremity between said abutments in an axially fixed relative position, said sleeve having an inner diameter slightly exceeding the outer diameter of said extremity whereby an annular clearance is formed between said extremity and said sleeve;
a heating coil insulatedly received in said shell and provided with a supply lead passing through said shell and provided with a supply lead passing through said extremity; and
a thermally conductive dielectric mass in the interior of said shell, said heating coil consisting of resistance wire imbedded in said mass.

3,927,302
RECORD CARD SYSTEMS

Kenneth Lamb, Shiremoor, and Roderick Wilson Froud, Durham, both of England, assignors to International Time Recording Company Ltd., London, England

Filed Feb. 5, 1973, Ser. No. 329,385
Int. Cl.² G06K 1/12, 7/10, 19/00
U.S. Cl. 235—61.9 R **4 Claims**


WORK CYCLE & CHECK NUMBER
WRITE INSTRUCTION TO STORE UNIT
WORK CYCLE SIGNAL GENERATOR
LAMPS WORK CYCLE SIGNAL GENERATOR WRITE IN
WRITE PULSES FROM STORE UNIT

1. A time recording system, comprising:
a plurality of time recorder-payroll cards;
at least two time recorder units; and
a data processing unit;
wherein:
each time recorder-payroll card comprises a first region on which visible alpha-numeric information is applied representing day and time, and a second region carrying prerecorded data in punched form corresponding to an individual to whom the respective card relates;
each time recorder unit comprises:
solenoid-actuable print means positioned to apply alpha-numeric information to said first region of said record cards;
a plurality of solid-state light source elements positioned adjacent said second region of said cards;
a plurality of solid-state light sensor elements positioned opposed to said respective light source elements to generate respective electrical signals in response to activation thereof by said respective light source elements when a record card is in a fixed position in said recorder unit, said signals being representative of said pre-recorded punched data on a record card;
means responsive to the presence of a record card in said time recorder unit to a maximum permitted extent which is less than complete insertion for sequentially activating said solid-state light source elements and actuating said print means; and
said data processing unit comprises:
at least two data stores each coupled to the solid-state light sensor elements of a respective time recorder unit;
means for continuously scanning said data stores to determine which if any of said data stores contains data from said respective time recorder;
a time signal generator to generate time signals; and
means responsive to said data store scanning means to read said date from said data stores, said data being applied to an output together with said time signals.

3,927,303
INFORMATION EVALUATION MEANS

Norbert Wefers; Uwe Militz; Uwe Unglaube, all of Berlin, and Joachim Schwarzkopf, Oldenburg, all of Germany, assignors to Nixdorf Computer AG, Paderborn, Germany

Filed Feb. 22, 1973, Ser. No. 334,643

Claims priority, application Germany, Feb. 22, 1972, 2208309

Int. Cl.² G06K *7/10, 19/06*

U.S. Cl. 235—61.11 E **19 Claims**

1. A method of evaluating data in the form of parallel data lines of varying width printed serially on a data carrier and of width varied in accordance with a predetermined coding, said method comprising the steps of:

a. moving a transducer, said transducer sensitive to the alternating contrast between the data carrier and the data lines and adapted to produce an output corresponding to said alternating contrast, across said data lines and generally perpendicular thereto wherein said transducer output corresponds in a time sequence to the distribution of said data lines,

b. comparing said transducer output with a fixed frequency reference signal,

c. storing the result of said comparison for a predetermined time period at least equal to the time required to move the transducer over a predetermined number of said data line or lines,

d. identifying the character of the scanned data line or lines as to its or their width encoding, and

e. utilizing the character identification in conjunction with said stored comparison to restore a new comparison for said character identification of succeeding data lines this rendering said character identification substantially independent of scanning speed variation.

3,927,304
FUEL CONTROL SYSTEMS

Philip Rossell Wentworth, Birmingham, and Michael Murray Bertioli, Lichfield, both of England, assignors to The Lucas Electrical Company Ltd., Birmingham, England

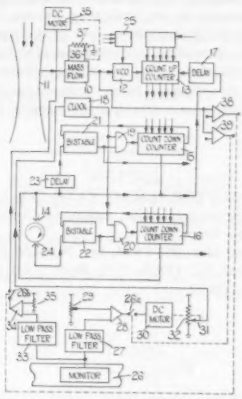
Filed Feb. 19, 1974, Ser. No. 443,847

Claims priority, application United Kingdom, Feb. 20, 1973, 8214/73; Mar. 31, 1973, 15595/73

Int. Cl.² G06F *15/20*

U.S. Cl. 235—150.21 **6 Claims**

1. A fuel control system comprising means for producing an electrical output pulse, the length of which determines the quantity of fuel to be fed to the engine, in response to at least one engine parameter, means for monitoring the exhaust emission of the engine, means responsive to the monitoring means for deriving a signal representative of the nature of the exhaust emission, at least two independent means for adjusting the length of the electrical output in accordance with the derived signal, and means for selectively operating at least one of said two independent means, said means for producing an electrical output pulse, comprising, a transducer sensitive to said at least one engine parameter, a variable frequency oscillator the frequency of which is controlled by said transducer, a count-up counter for receiving pulses from said variable frequency oscillator, for a predetermined fraction of an engine cycle, so as to produce in said count-up a count state representative of said at least one engine parameter, a count-down counter connected to the count-up counter for the transfer of said count state at the end of said fraction of the engine cycle,



and a variable frequency clock pulse generator for supplying pulses to said count-down counter to determine the length of said output pulse, said two independent means for adjusting said output pulse length comprising means for adjusting the clock pulse frequency and means for modifying the output of said transducer respectively.

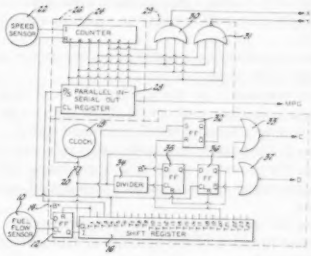
3,927,305
FUEL ECONOMY INDICATOR HAVING RANGE SELECTED FILTERS

Frederick Gruhl, Almont, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 3, 1975, Ser. No. 554,742

Int. Cl.² G01M *15/00*

U.S. Cl. 235—150.21 **2 Claims**



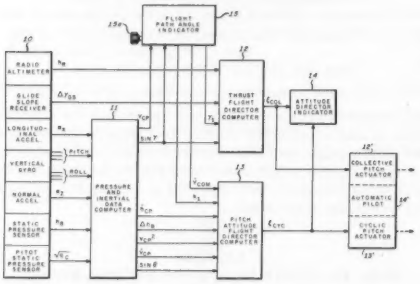
1. A vehicle fuel economy indicator having range selected filters comprising: means for generating a signal representing vehicle speed; means for generating a fuel consumption signal representing vehicle fuel consumption; means responsive to the speed signal and the fuel consumption signal for generating a fuel economy signal representing the instantaneous vehicle fuel economy, the instantaneous vehicle fuel economy being variable over a specified number of ranges in response to vehicle operating parameter variations; a plurality of signal filters, each signal filter having a respective time constant associated with a respective one of the ranges of vehicle fuel economy; means for coupling the fuel economy signal to each of the signal filters, each of the signal filters supplying an

output signal whose time response to variations in the instantaneous vehicle fuel economy is determined by the time constant of said signal filter; indicating means; and gate means responsive to the fuel economy signal for coupling the output signal from the signal filter having the time constant associated with the range of fuel economy embracing the instantaneous fuel economy to the indicating means, the indicating means being responsive to the output of the signal filter coupled thereto for providing an indication of vehicle fuel economy, whereby the time response of the indication of vehicle fuel economy to variations in the instantaneous vehicle fuel economy is varied as a function of vehicle fuel economy range.

3,927,306
HELICOPTER FLIGHT PATH CONTROL

Harry Miller, Scottsdale, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,321
Int. Cl.² G06G 7/70; B64C 13/50
U.S. Cl. 235—150.22 **17 Claims**



1. Apparatus by means of which an aircraft may be controlled so as to follow a selectable flight path relative to the horizontal at a programmed acceleration therealong to a predetermined constant velocity through adjustment of the thrust and pitch attitude controls of said aircraft, the combination comprising:

means for selecting a desired flight path angle and providing a flight path angle reference signal in accordance therewith,

means for providing a signal in accordance with the actual flight path angle,

means responsive to the algebraic sum of said flight path angle reference and actual flight path angle signals for providing a thrust control command signal,

means for providing an acceleration reference signal,

means for providing a signal in accordance with the actual acceleration of said aircraft along said selected flight path,

means for providing a signal proportional to a predetermined function of the velocity of said aircraft along said flight path,

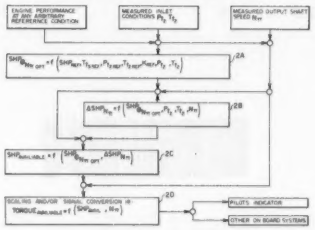
means responsive to the algebraic sum of said reference acceleration signal, said actual acceleration signal, and said signal proportional to a predetermined function of said velocity for providing a pitch control command signal, and

utilization means responsive to said command signals adapted to govern the adjustment of said thrust and pitch controls of said aircraft whereby if the thrust and pitch of said aircraft are simultaneously controlled in accordance with the operation of said utilization means such as to maintain said command signals zero, said aircraft will follow said selectable flight path at said programmed acceleration along said selectable flight path to said predetermined constant velocity.

3,927,307
POWER AVAILABLE INDICATOR

Robert J. Reschak, Hurst, Tex., assignor to Textron Inc., Providence, R.I.

Filed Mar. 1, 1974, Ser. No. 447,072
Int. Cl.² G06G 7/70
U.S. Cl. 235—151.3 **6 Claims**


ENGINE PERFORMANCE AT ANY ARBITRARY REFERENCE CONDITION
MEASURED INLET CONDITIONS
MEASURED OUTPUT SHAFT SPEED
SCALING AND/OR SIGNAL CONVERSION
PILOT'S INDICATOR
OTHER ON BOARD SYSTEMS

1. A system for calculating while in flight the maximum power available from an aircraft turbine engine, which comprises:

a. sensors for generating signals continuously representative of the compressor inlet temperature, the compressor inlet pressure and the output shaft speed of the engine;

b. a storage means for engine performance reference signals including only standard day sea level pressure and temperature, shaft horsepower at standard sea level static conditions for a particular engine power rating, and controlled turbine inlet gas temperature;

c. means responsive to said reference signals and said signals from said sensors to generate an output signal representing available power; and

d. means for displaying said output signal.

3,927,308
MONITOR AND RESULTS COMPUTER SYSTEM

William A. Summers, North Haledon; Betty L. Christy, Radburn, both of N.J., and Joseph V. Sweeney, Manhasset, N.Y., assignors to Ebasco Services Incorporated, New York, N.Y.

Division of Ser. No. 308,770, Nov. 22, 1972, Pat. No. 3,855,456. This application June 3, 1974, Ser. No. 475,987
Int. Cl.² G06G 7/12; G06F 7/04
U.S. Cl. 235—151.3 **21 Claims**

1. A method of producing a value which is most representative of a condition determined by a plurality of physical measurement input devices which are responsive to the condition which can change, the method comprising the steps of:

a. receiving signals from a plurality of input devices, the signals representing the values which are responsive to the condition;

b. averaging the value represented by each of the received signals with the value represented by each of the other received signals to derive a set of averages;

c. selecting a predetermined non-linear factor which corresponds to the probable disagreement between the received signals;

d. forming a normalized average for each of the set averages by dividing each average by the non-linear factor;

e. subtracting from the value represented by each of the received signals the value represented by each of the other signals to derive a set of absolute differences:

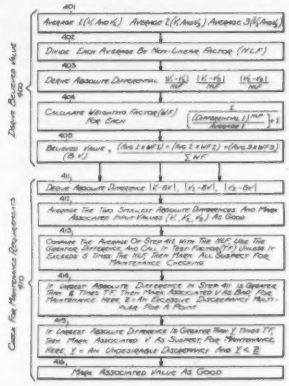
f. dividing each of the absolute differences by the non-linear factor to provide a first set of normalized differentials;

g. selecting a predetermined non-linear power which controls the degree of weighting for each signal as a function of its deviation from the other received signals;

h. raising each of the first normalized differentials by the selected non-linear power;

i. deriving a weighting factor for each average whose value is a function of its normalized average and its normalized differential raised by the selected non-linear power;

j. weighting each average by the weighting factor derived for that average; and

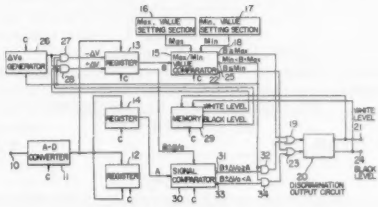


k. forming a composite of the weighted averages to thereby derive a value which is most representative of the condition.

3,927,309
SIGNAL LEVEL DISCRIMINATION CIRCUIT

Susumu Fujiwara, Fujisawa; Takao Okada, Yokohama; Masao Koyama, Hatano; Hiromitsu Akashi, and Yoichi Nishikawa, both of Hiratsuka, all of Japan, assignors to The Yokohama Rubber Company, Ltd., Japan

Filed Oct. 4, 1974, Ser. No. 512,164
Claims priority, application Japan, Oct. 9, 1973, 48-112850
Int. Cl.[2] H03K *5/153, 5/18*
U.S. Cl. 235—151.31 **2 Claims**



1. A signal level discrimination circuit which comprises:

a. an analog-to-digital converter (**11**) for converting an input analog signal, whose level is to be discriminated, into a digital signals;

b. a first register (**13**) for storing the digital signal introduced thereinto by the analog-to-digital converter;

c. a second register (**14**) storing a preceding digital signal which has been stored in the first register immediately before a present digital signal is stored in the first register;

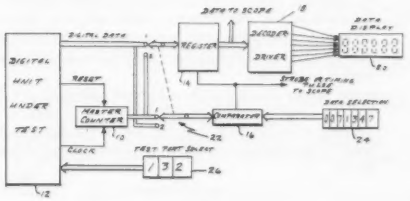
d. a first comparator (**30**) in which the present digital signal stored in the first register and the preceding digital signal stored in the second register are compared with each other to produce an output signal indicative of whether the absolute value of difference between the present digital signal and the preceding digital signal is greater or less than a predetermined value; and

e. a signal level discrimination output circuit (**20**) which receives the output signal from the comparator, and discriminates that the level of the present digital signal stored in the first register is the same as that of the preceding digital signal stored in the second register when the output signal from the comparator indicates that the absolute value is less than the predetermined value and that the level of the present digital signal store in the first register is different from that of the preceding digital signal stored in the second register when the output signal from the comparator indicates that the absolute value is greater than the predetermined value.

3,927,310
DIGITAL TEST APPARATUS

Ronald F. D'Anna, Baltimore, and Richard E. Llewellyn, Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 25, 1974, Ser. No. 436,562
Int. Cl.[2] G06F *11/00;* **G01R** *15/00*
U.S. Cl. 235—153 AC **7 Claims**



1. A digital test apparatus for the test of digital equipment utilizing multiplexed data ports comprising in combination:

test port selecting means connected to the unit under test for selecting the test port to be tested,

data selecting means connected to said unit under test for selecting preselected data within said unit under test, said preselected data having a predetermined time within the time cycle of the unit under test,

means for synchronizing the timing of said test apparatus with said unit under test connected to said test apparatus and said unit under test, said synchronizing means receiving clock and reset signals from said unit under test, said synchronizing means providing timing signals to said test apparatus,

means for acquiring said preselected data from said unit under test, said acquiring means acquiring said preselected data when said synchronizing means' timing coincides with preselected time, and

means for displaying said preselected data from said acquiring means.

3,927,311
ARITHMETIC SYSTEM FOR HALVING AND DOUBLING DECIMAL NUMBERS

Tien C. Chen, San Jose, Calif., and Irving T. Ho, Poughkeepsie, N.Y., assignors to International Business Machines, Corporation, Armonk, N.Y.

Filed Aug. 20, 1974, Ser. No. 498,898
Int. Cl.[2] G06F *7/52*
U.S. Cl. 235—159 **6 Claims**

1. An arithmetic system for halving or doubling a decimal number, comprising:

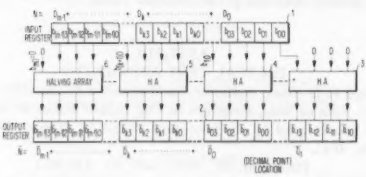
an input register for temporarily storing said decimal number in binary coded decimal form,

an output register for receiving an output decimal number in binary coded decimal form, and

a plurality of logic arrays connected to receive in parallel the bits in said input register and to generate a parallel output which is connected to said output register, each of said logic arrays including

first decoder/driver means receiving two bits in a sequence of four bits and providing a plurality of column outputs;

second decoder/driver means receiving the remaining two bits in said sequence four bits and providing a plurality of row outputs;



a read only memory matrix of column and row conductors connected respectively to said column outputs and to said row outputs and having actuaable switches at selected matrix intersections, each said switch being actuated by simultaneous outputs on the column and row conductors forming the intersection at which said switch is located;

sensing means connected to said read only memory matrix for combining outputs from said matrix to generate an output sequence of four bits which comprise part of said output decimal number in binary coded decimal form.

3,927,312

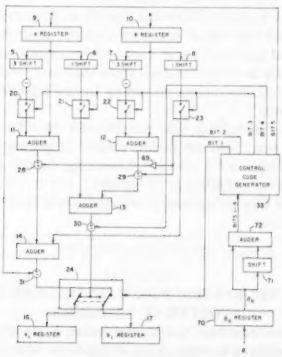
VECTOR ROTATOR

Warren D. Dickinson, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 31, 1974, Ser. No. 519,735

Int. Cl.² G06F *7/38*

U.S. Cl. 235—189 **7 Claims**



1. A method for determining the vector components of a vector to be rotated $\theta°$ comprising the steps of:

determining the components of the vector rotated $\theta_1°$ in even **30°** increments such that θ_1 equal θ within a $\pm$ **15°** error;

selecting rotation angles from **0** to **15°** in steps to represent $\theta_2°$ such that $\theta_1 \pm \theta_2$ can be selected such that any error between the algebraic sum of them and θ is within $\pm$ one half of one of said steps;

rotating $\theta_2°$ the vector components of the vector already rotated $\theta_1°$; and

selecting θ_2 such that the combination of θ_1 and $\pm\ \theta_2$ is most nearly equal to θ.

3,927,313

SURGICAL OPERATING LAMP WITH INDIVIDUAL SPOT-LIGHTS

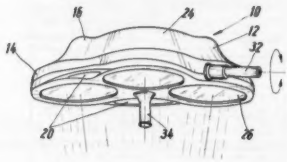
Franz Dieter Herold, Worfelden, Germany, assignor to Original Hanau Quarzlampen GmbH, Hanau, Germany

Filed Jan. 23, 1974, Ser. No. 435,797

Claims priority, application Germany, Feb. 6, 1973, 2305665

Int. Cl.² A61G *13/00*; **F21V** *33/00*

U.S. Cl. 240—1.4 **2 Claims**



1. In a surgical operating lamp having a lighting body with individual, adjustable spotlights within the lighting body, the light rays of said spot-lights meeting approximately on the central axis at a distance from the lighting body, the improvements comprising:

a. said individual lights are three in number and are disposed 120° from each other about the central axis of the lighting body,

b. said lighting body tightly encloses said three individual lights and consists of an upper and lower portion attached together, said lower portion being attached to a lamp support means, wherein body said upper and said lower portions are generally triangular in plan view having convex vertices surrounding said three individual lamps and concave sides joining said vertices and,

c. handles attached to the lower portion of the body at two of the concave sides to enable adjustment of the position of the lamp.

3,927,314

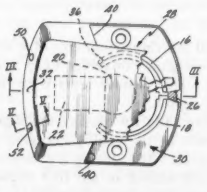
BOW LIGHT FOR WATER CRAFT

Ronald E. Wiggerman, Grand Rapids, Mich., assignor to Attwood Corporation, Lowell, Mich.

Filed Nov. 14, 1974, Ser. No. 523,691

Int. Cl.² B63B *45/04*

U.S. Cl. 240—7.5 **4 Claims**



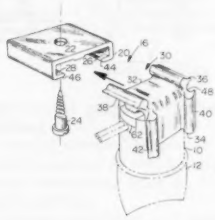
1. In a bow light for water craft having a housing; lens means in said housing viewable forwardly and from the sides of said housing, said lens means including a pair of lenses adapted to emit light beams of different colors forwardly at opposite sides of said bow light; a wall on said housing obstructing viewing of said lens means from the rear thereof; and a light source in

said housing adapted to emit light through said lens means, the improvement comprising: light transmitting means positioned in and extending through said wall, said light transmitting means being responsive to operation of said source to transmit light rays from said light source to the rear of said housing to thereby provide an indication at said wall when said light source is operative, said light transmitting means including a pair of light transmitting elements positioned in said wall and at generally opposite sides thereof, each said transmitting element being of the same color as the color emitted by said lens on its side.

3,927,315
LIGHT SOCKET MOUNTING

Arthur W. Werry, Menlo Park, Calif., assignor to Dale-Jones Corporation, San Jose, Calif.

Filed Nov. 14, 1974, Ser. No. 523,572
Int. Cl.² F21V *21/08*
U.S. Cl. 240—52.1 **8 Claims**



1. In a light socket having a body portion forming a socket opening and base portion having means disposed for effecting an electrical connection with a pair of wires, the improvement comprising:

a. a base element disposed for attachment to a supporting structure and including means defining a pair of slideways at opposite sides of said base in opposed relationship to one another; and

b. a slide member formed integrally with the base portion of the socket and including a pair of portions each having means forming a pair of runners, with each of the runners on each portion being disposed for being slidably received in a respective one of said slideways for releasable attachment of said slide member with said base element, said portions of said slide member being disposed at an angle with respect to one another, such that the body portion of the light socket can be mounted in either of two positions with respect to a supporting structure which is disposed for receiving said mounting member thereon.

3,927,316
WIRELESS SPEAKER SYSTEM USING INFRA-RED LINK

Richard W. Citta, Oak Park, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed June 7, 1974, Ser. No. 477,535
Int. Cl.² H04B *9/00*
U.S. Cl. 250—199 **10 Claims**

1. A communication system for developing and translating an information signal to an information reproducer, said system comprising:

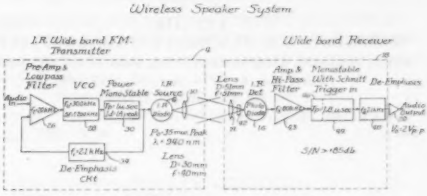
a transmitter comprising an oscillator, for developing a carrier signal of a predetermined center frequency,

means for coupling said information signal to said oscillator for frequency modulating said carrier signal in accordance with said information signal to deviate said carrier over a super wide band of frequencies such that the peak deviation of the carrier is of the same order of magnitude as the frequency of the carrier itself and the modulation index of said transmitter is substantially greater than the modulation index of a standard FM broadcasting service,

means responsive to the modulated output of said oscillator for generating a train of pulses of substantially constant width and height,

a light source, responsive to said train of pulses, for producing and transmitting a modulated beam of light energy, and

a negative feedback system coupled between the output of said pulse generating means and the input of said oscillator, said feedback system comprising a de-emphasis network for stabilizing the center frequency of the oscillator and for linearizing the voltage v. frequency characteristic



of the oscillator over said super wide range of frequency deviation;

receiver means comprising a photodetector responsive to said modulated beam of light energy for deriving an electrical signal,

means responsive to said electrical signal for reconstituting a replica of said original train of pulses,

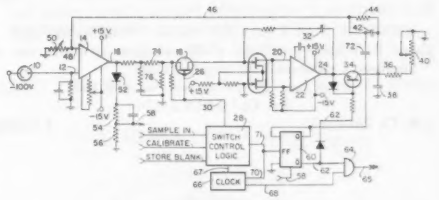
demodulation means responsive to said reconstituted train of pulses for deriving said information signal therefrom, and

means for applying said information signal to said information reproducer.

3,927,317
BLANK VALUE STORING PHOTOMETER CIRCUITRY

Gerhard A. Liedholz, Miami, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Continuation of Ser. No. 242,049, April 7, 1972, Pat. No. 3,752,995. This application June 29, 1973, Ser. No. 374,874The portion of the term of this patent subsequent to Aug. 14, 1990, has been disclaimed.
Int. Cl.² H01J *39/12*
U.S. Cl. 250—214 R **15 Claims**



1. Blank storing photometer circuitry comprising: first and second multi-function amplifiers having inputs and outputs, a first switch coupling the output of said first amplifier to an input of said second amplifier, voltage rundown circuit means, a second switch coupling the output of said second amplifier to said rundown circuit means, blank value storing means coupled to said second amplifier, a path coupling said rundown circuit means to one input of said first amplifier, a second input of said first amplifier connected to receive photometrically transduced signals, and control circuits for controlling the operation of said first and second switches and thereby defining three operating modes as well as generating a measurement of the photometrically transduced signals based upon their voltage rundown, said three operating modes

being: a blank storage mode during which both said amplifiers act as amplifiers, both said switches are in a first stage and said blank storing means stores the blank value; a calibration mode during which said first amplifier acts as a comparator between the stored blank value and a then being applied calibration value to which the blank value is being rundown, the second amplifier and blank storing means coact to define a blank storage circuit, and said switches are in a second state; and a sample measuring mode which is substantially the same as said calibration mode, except that the comparison is between the stored blank value and one of a plurality of sample values then being applied.

3,927,318

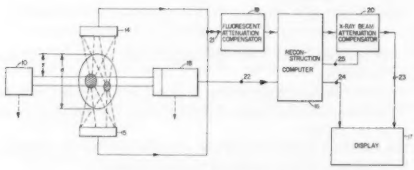
CROSS-SECTIONAL FLUORESCENT IMAGING SYSTEM

Albert Macovski, 4100 Mackay Drive, Palo Alto, Calif. 94306

Filed May 6, 1974, Ser. No. 467,446

Int. Cl. G01N *23/20*

U.S. Cl. 250—272 **13 Claims**



1. Apparatus for imaging fluorescent radiation from a specific material in a cross section of an object comprising:

an x-ray beam directed through the cross section of the object;

means for translating the x-ray beam so that all regions of the cross section are excited at a plurality of angles;

means for detecting the integrated fluorescent radiation emitted along the entire x-ray beam at each position of the x-ray beam and forming a plurality of integrated emission signals;

a computer for reconstructing the fluorescent radiation information of the cross section of the object from the plurality of integrated emission signals; and

means for displaying the reconstructed fluorescent radiation information.

3,927,319

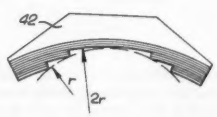
CRYSTAL FOR X-RAY CRYSTAL SPECTROMETER

David B. Wittry, Pasadena, Calif., assignor to University of Southern California, Los Angeles, Calif.

Filed June 28, 1974, Ser. No. 484,165

Int. Cl.² G01N *23/20*

U.S. Cl. 250—273 **9 Claims**



1. A crystal for an x-ray crystal spectrometer and the like, comprising:

a cylindrical curved crystal comprising a plurality of separate strips of bulk single crystal material joined in a sandwich form having a plurality of substantially parallel surfaces in a stepped configuration,

with the steps substantially on a focal circle of radius *r*, and with the crystal atomic planes on circles of radius substantially *2r*.

3,927,320

METHOD AND APPARATUS FOR DERIVING FROM A SCANNING ELECTRON MICROSCOPE SIGNALS THAT CAN BE DISPLAYED STEREOSCOPICALLY

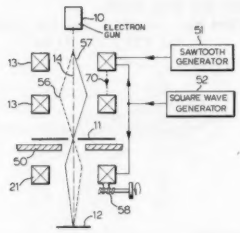
Eric John Chatfield, and Verner Henrick Nielsen, both of Oakville, Ontario, Canada, assignors to Ontario Research Foundation, Ontario, Canada

Filed Aug. 2, 1974, Ser. No. 493,878

Claims priority, application United Kingdom, Aug. 14, 1973, 38483/73

Int. Cl.² G01N *23/00*

U.S. Cl. 250—307 **22 Claims**

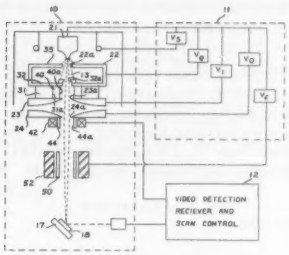


16. A method for operating a scanning electron microscope of the type having an electron gun, a final aperture through which at least a part of said beam passes prior to impingement on an object being scanned by said electron beam and a longitudinal axis extending from said electron gun through said final aperture and through the object being scanned by said electron beam to enable said scanning electron microscope to generate signals that enable an image of the object being scanned by said electron beam to be viewed in three dimensions, said method comprising: (a) scanning said electron beam across the object being scanned in adjacent parallel lines, (b) between said electron gun and said final aperture and in addition to any deflection of said electron beam by said scanning (i) providing a field during the scanning of a first set of said lines which deflects an electron beam that is travelling from said electron gun through said final aperture on said longitudinal axis in a first path firstly away from said longitudinal axis and to one side of said longitudinal axis and lastly towards said longitudinal axis to intersect said longitudinal axis in the immediate vicinity of said final aperture and then to proceed away from said longitudinal axis but on the opposite side thereof and (ii) providing a field during the scanning of a second set of said lines which deflects an electron beam that is travelling from said electron gun through said final aperture on said longitudinal axis in a second path firstly away from said longitudinal axis and to said opposite side thereof and lastly toward said longitudinal axis to intersect said longitudinal axis in the immediate vicinity of said final aperture and then to proceed away from said longitudinal axis but on said one side thereof, and (c) between said final aperture and the object being scanned by said electron beam, and in addition to any deflection of said electron beam by said scanning, during said scanning of said respective sets of lines providing fields which are of such a nature that, when acting upon electron beams travelling in the portions of said first and second paths that are beyond said final aperture, deflect electron beams travelling in the portions of said first and second paths respectively that are beyond said final aperture back towards said longitudinal axis to intersect said longitudinal axis at the object being scanned by said electron beam from both said one and said opposite sides thereof.

3,927,321
ELECTRON MICROSCOPE BEAM TUBE

Leonard M. Welter, Saratoga, Calif., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 24, 1974, Ser. No. 463,630
Int. Cl.[2] H01J 37/26
U.S. Cl. 250—311 4 Claims

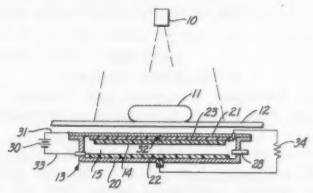


1. In a charged particle microprobe system including
a housing defining a vacuum chamber;
a source of charged particles disposed in said chamber;
apertured means disposed in said housing for establishing focusing and accelerating fields for forming a beam of said charged particles;
means for deflecting said beam in a predetermined raster pattern;
the improvement comprising a tube, being generally physically and electrically symmetrical about an axis, said tube being disposed in said microprobe with its axis substantially aligned with said beam and in electrical contact with a voltage source, said tube being formed of a non-magnetic material having a substantially uniform cross-sectional conductivity and a predetermined value of resistance of 10^3 to 10^9 ohms/cm over its axial length whereby said tube is electrically conductive yet free of high eddy currents.

3,927,322
ELECTRODE FOR ELECTRONRADIOGRAPHY IMAGING CHAMBER

Teodoro Azzarelli, Los Angeles; Eric P. Muntz, Pasadena, and Paul B. Scott, Topanga, all of Calif., assignors to Xonics, Inc., Van Nuys, Calif.

Filed Nov. 8, 1974, Ser. No. 522,086
Int. Cl.[2] G03B 41/16
U.S. Cl. 250—315 6 Claims

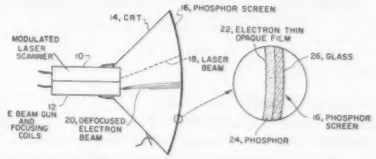


1. In an imaging chamber for an *x*-ray system, the combination of:
first and second substantially planar electrodes, each of said electrodes including a spiral resistor and a low conductivity layer in contact with said spiral resistor;
means for mounting sid electrodes in the chamber in spaced relation defining a gap therebetween;
means for connecting a power supply to an end of said first electrode spiral resistor and to an end of said second electrode spiral resistor; and
a third resistor connected between the other ends of said spiral resistors completing a current path across the power supply to produce an electrostatic field in the gap with electrostatic potentials along the gap surfaces corresponding to the electrostatic potentials for concentric spherical metal electrodes so that extensions of the electric field lines in said gap converge substantially to a point.

3,927,323
VIDEO PHOSPHOR MOTION PERCEPTION DISPLAY

Paul M. Koloc, College Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 20, 1973, Ser. No. 399,029
Int. Cl. G11b 7/04
U.S. Cl. 250—329 7 Claims

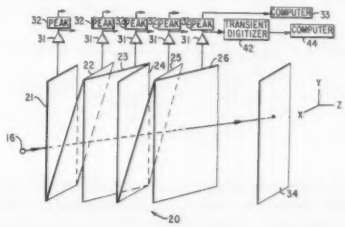


1. A method of displaying moving objects in a stationary scene on a phosphorous screen comprising the steps of:
exciting said phosphorous screen at a constant excitation rate;
modulating a thermal laser source with image information of said scene;
scanning said thermal laser source across said phosphorous screen to impress a thermal image of said scene on said phosphorous screen to cause varying thermal states and thereby varying intensities on phosphors corresponding to moving objects.

3,927,324
MICROMETEOROID VELOCITY AND TRAJECTORY ANALYZER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Siegfried O. Auer, Lanham, Md.

Filed Aug. 30, 1974, Ser. No. 502,135
Int. Cl.[2] G01T 1/16
U.S. Cl. 250—336 14 Claims



13. Apparatus for enabling the position of a charged particle to be detected comprising: an array of detectors pervious to the particle and positioned to be in a line of flight of the particle; each of said detectors including an electrode for deriving an output voltage pulse in response to a charge varia-

tion induced therein resulting from a charge transfer between the particle and the electrode as the particle passes through the electrode; and means responsive to the pulses derived from all of the detectors of the array for deriving a signal enabling the position of the particle as it traverses the array to be determined.

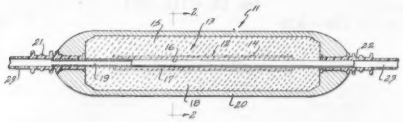
3,927,325
TISSUE IRRADIATOR

Frank Porter Hungate, Kennewick; William Frederic Riemath, Pasco, and Lee Roy Bunnell, Kennewick, all of Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 10, 1974, Ser. No. 487,327

Int. Cl.[2] A61N *5/12;* **G01N** *21/24;* **G21G** *4/00*

U.S. Cl. 250—435 **10 Claims**



1. A tissue irradiator comprising:

a radioisotope material contained in, dispersed through, and encapsulated by a first portion of vitreous carbon, which portion is surrounded and encapsulated by a containment portion of vitreous carbon.

3,927,326
X-RAY EXAMINING APPARATUS

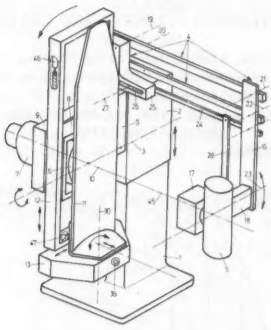
Kurt Kunne, Erlangen, and Fritz Wittkopp, Weiher, both of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Sept. 23, 1974, Ser. No. 508,469

Claims priority, application Germany, Sept. 24, 1973, 2348039

Int. Cl.[2] A61B *6/00*

U.S. Cl. 250—447 **12 Claims**



1. In an X-ray examining apparatus having a pedestal base; a vertically displaceable support block mounted on said base; a carrier supported on said support block for rotation about a horizontal pivot axis; a picture target mounted on said carrier and being oriented in parallel with said pivot axis; an X-ray tube being focused on said picture target; and patient support means interposed between said X-ray tube and said picture target, the improvement comprising: said carrier for said X-ray tube and picture target being dually offset in a U-shape in a plane oriented perpendicular to said picture target, said U-shape forming a first and a second arm, said first arm supporting said picture target and being fastened to said support block for rotation about said horizontal pivot axis, said X-ray tube being fastened to said second arm having the central X-ray beam thereof directed towards said picture target; a carrying frame for a patient support rotatable about an axis parallel to the surface of said picture target; and a subframe rotatable about the median perpendicular of said picture target supporting said first arm, said subframe being longitudinally movably mounted on said carrying frame.

3,927,327
EXCHANGE MECHANISM FOR FILM PLATES IN AN X-AY RECORDING OR DISPLAYING APPARATUS

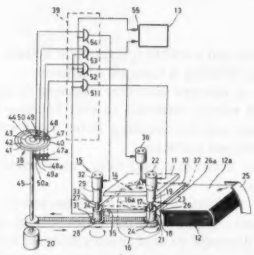
Gunnar Valfrid Bermas, Stockholm, Sweden, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 451,781

Claims priority, application Sweden, Mar. 16, 1973, 7303710

Int. Cl.[2] G11B *1/00*

U.S. Cl. 250—470 **4 Claims**



1. An X-ray film plate exchanger mechanism for moving individual unexposed x-ray film plates of rectangular shape into an active position where exposure thereof may occur and for removing film plates from said active position, comprising:

a feeding-in mechanism comprising gripping apparatus for releasably gripping a corner of a film plate urged thereto, said gripping apparatus being mounted adjacent a corner of said active position for rotation about an axis perpendicular to the gripped film plate, swinging the film plate within its own plane about the gripped corner into said active position;

means for urging a corner of an exposed film plate toward said gripping apparatus of said feeding-in mechanism;

a feeding-out mechanism substantially the same as said feeding-in mechanism, but positioned adjacent a separate corner of said active position for releasably gripping a separate corner of a film plate in said active position, swinging the film plate within its own plane about said separate gripped corner out of said active position.

3,927,328
DOSIMETRY METHOD

Hidetsugu Kawabata, Neyagawa, and Tadaoki Yamashita, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 195,082, Nov. 2, 1971, abandoned. This application Nov. 20, 1973, Ser. No. 417,574

Claims priority, application Japan, Nov. 18, 1970, 45-102281; Nov. 18, 1970, 45-102282

Int. Cl. G01t *1/11;* **C09r** *11/14, 11/46*

U.S. Cl. 250—473 **2 Claims**

1. A dosimetry method comprising

exposing a thermoluminescent dosimeter including a thermoluminescent phosphor comprising sodium sulfate as the host material and at least one activator selected from the group consisting of dysprosium, holmium, thulium

and terbium in an amount of 3×10^{-5} to 1×10^{-2} gram-atoms with respect to 1 mol of sodium sulfate to gamma radiation,

heating the radiated dosimeter to about 300°C,

measuring the luminescence emission and quantitatively relating the radiation incident thereon.

3,927,329

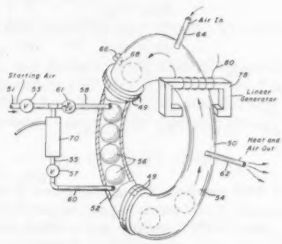
METHOD AND APPARATUS FOR CONVERTING ONE FORM OF ENERGY INTO ANOTHER FORM OF ENERGY

Sherwood L. Fawcett, Columbus, and James N. Anno, Cincinnati, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Division of Ser. No. 323,770, Jan. 15, 1973, Pat. No. 3,859,789, which is a continuation-in-part of Ser. No. 222,220, Jan. 31, 1972, abandoned. This application Apr. 11, 1974, Ser. No. 460,187

Int. Cl.² H02P *9/04*; **F15B** *21/00*

U.S. Cl. 290—1 **10 Claims**



1. In the method for converting the kinetic energy of moving bodies into electrical energy, the steps of:

a. providing a closed, continuous loop passageway formed from non-magnetically permeable material and containing a plurality of freely movable, mechanically unrestrained bodies;

b. applying a force to successive ones of said bodies in a first region of said passageway to thereby propel successive ones of the bodies in one direction around the passageway;

c. permitting said bodies, after being propelled, to essentially freely accelerate in a second region of the passageway;

d. at a point beyond said first and second regions in the passageway providing lines of flux which intersect the path of travel of said freely movable bodies passing through said passageway whereby the propelled bodies will intersect the lines of flux thus produced to generate an electrical current; and

e. then returning successive ones of said bodies through a third region back to said first region where they are again propelled in said one direction, the bodies being further decelerated in said third region.

3,927,330

WATER POWER MACHINE AND UNDER SEA, UNDER WATER GENERATOR STATION

Roy E. Skorupinski, 6402 Jim, Houston, Tex. 77018

Filed Apr. 29, 1974, Ser. No. 464,961

Int. Cl.² F03B *13/00*; **E02B** *9/08*

U.S. Cl. 290—54 **20 Claims**

1. A power generator which comprises:

an endless conveyor;

a pair of spaced rollers supporting said conveyor for movement along a specified path between said rollers;

at least a pair of individually openable containers carried on said conveyor along the path and having an exposed face which intercepts flowing water to impart a water created force to said conveyor to cause it to move along the specified path;

said conveyor comprising

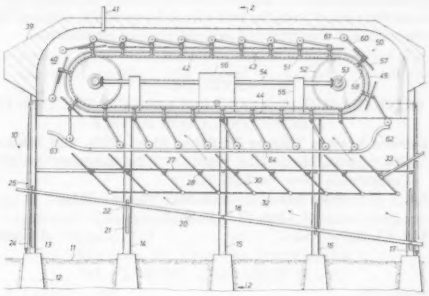
a set of plates located along its length;

hinged paddles extending outwardly at an angle relative to said plates to intercept current flow in water to create a force acting on said paddles, said plates and said paddles comprising said containers on said conveyor which are spaced lengthwise from one another on said conveyor;

an endless chain which engages said rollers and supports said containers;

an oval housing which encloses said chain and rollers therein;

a lengthwise slot in said housing adjacent to and parallel to the path of said chain;



container supports extending from said chain outwardly from said chain to support said containers;

an elongate flexible band overlying said slot and encircling said housing, said band slidably moving along and over said slot;

a groove adjacent to said slot on each side thereof;

a resilient elongate seal carried by said band sealing and slidably engaged with said grooves to exclude water from entry into said housing through said slot, said seal being located on one side of said band and said containers being on the opposite side of said band;

relatively fixed means for directly flowing water toward said conveyor to impinge on it at the portion extending along the specified path; and,

electric generator means in said housing connected to one of said rollers for generating electric power.

3,927,331

SIGNAL PHASE DETECTOR

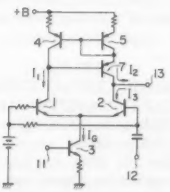
Akio Nakashima, and Yoshihiro Arakawa, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed May 3, 1974, Ser. No. 466,852

Claims priority, application Japan, May 5, 1973, 48-50067

Int. Cl.² H03K *5/20*

U.S. Cl. 307—232 **2 Claims**



1. A phase detecting circuit comprising a differential amplifier with a pair of transistors, a first transistor with its collector connected to the emitters of said pair of transistors and with

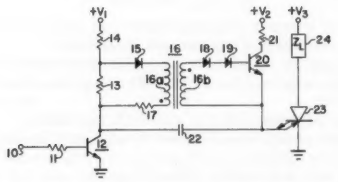
its emitter connected to a first point of reference potential, a second transistor with its collector connected to the collector of one of the transistors of said differential amplifier and with its emitter connected to a second point of reference potential, a third transistor with its emitter connected to said second point of reference potential and with its base connected to the base of said second transistor, the base and collector of said third transistor being short-circuited, a fourth transistor with its emitter connected to the collector of said third transistor and with its base connected to the collector of said second transistor, the collector of said fourth transistor being connected to the collector of the other said transistors of said differential amplifier, means for supplying a reference signal to the base of said first transistor, means for applying a signal to be compared with said reference signal to the base of a selected one of the one and the other of said transistors of said differential amplifier, and means of collecting an output signal from the collector of the nonselected one of the one and the other of said transistors of said differential amplifier.

3,927,332

DRIVE CIRCUIT FOR CONTROLLING CONDUCTION OF A SEMICONDUCTOR DEVICE

Edward Francis Thomas McKeon, Short Hills, and Michael Ray Martin, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 24, 1975, Ser. No. 552,581
Int. Cl.² H03K *17/72*
U.S. Cl. 307—252 C **5 Claims**



1. A drive circuit for a gated semiconductor device, comprising:

first and second active current conducting devices;

a transformer including a first winding coupled to be energized by said first active device and a second winding coupled to control the conduction of said second active device;

a gated semiconductor device;

capacitance means coupled to said first active device and to a gate electrode of said gated semiconductor device for effecting turn-off of said gated semiconductor device in response to a first conduction state of said first active device;

said second active device being coupled to said gate electrode for providing drive current to enable conduction of said gated semiconductor device in response to a second conduction state of said first active device.

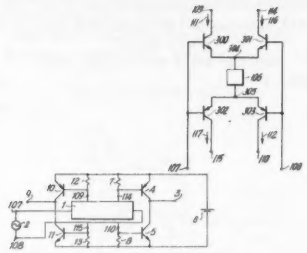
3,927,333

ELECTRONIC CIRCUIT COMPRISING COMPLEMENTARY SYMMETRICAL TRANSISTORS

Tokio Furuhashi, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Mar. 29, 1974, Ser. No. 456,176
Claims priority, application Japan, Apr. 7, 1973, 48-39911
Int. Cl.² H03K *17/60;* **H03F** *3/18*
U.S. Cl. 307—255 **2 Claims**

1. An electronic circuit comprising a power supply having first and second terminals, first and second and third impedance means, a first NPN transistor and a first PNP transistor having their bases connected in common at a first junction, a second NPN transistor and a second PNP transistor having their bases connected in common at a second junction, the emitters of said first NPN transistor and said second PNP transistor being connected to each other through said first impedance means, the emitters of said second NPN transistor and said first PNP transistor being connected to each other through said first impedance means, the collector of said first NPN transistor being connected to said first terminal of said power supply through said second impedance means, the collector of said first PNP transistor being connected to said second terminal of said power supply through said third impedance means, the collectors of said second NPN transistor and



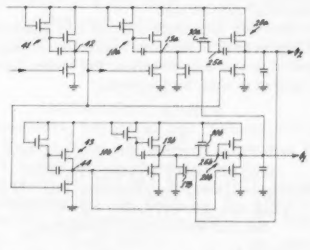
said second PNP transistor being connected to said first and second terminals of said power supply, respectively, an output terminal, a third NPN transistor and a third PNP transistor having their collectors connected in common at said output terminal, the bases of said third NPN transistor and said third PNP transistor being connected to the collectors of said first PNP transistor and said first NPN transistor, respectively, the emitters of said third NPN transistor and said third PNP transistor being connected to said second and first terminals of said power supply, respectively, and input signal supplying means connected between said first junction and said second junction, whereby sink and source currents are obtained at said output terminal.

3,927,334

MOSFET BISTRAP BUFFER

John Callahan, Mountain View, Calif., assignor to Electronic Arrays, Inc., Mountain View, Calif.

Filed Apr. 11, 1974, Ser. No. 460,027
Int. Cl.² H03K *5/15, 17/56, 19/08, 19/40*
U.S. Cl. 307—269 **4 Claims**



1. A MOSFET buffer system, comprising:

a first bootstrap inverter and a first bootstrap push-pull amplifier each having an output and two inputs, one input of each of said first bootstrap inverter and said first bootstrap push pull amplifier being connected for receiving an input signal, the respective other input of the first inverter connected for receiving a permanent bias;

a first, permanently gated-on MOSFET interconnecting the other input of the first push-pull amplifier and the output of the first inverter;

a second bootstrap inverter and a second bootstrap push-pull amplifier, each having an output and two inputs, one input of each of said second bootstrap inverter and said second strap push pull amplifier being connected for receiving an input signal, the respective other input of the second inverter connected for receiving a permanent bias;

a second permanently gated-on MOSFET interconnected to the other input of the second push-pull amplifier and the output of the second inverter;

means for providing the input signal to the one input in each of said first inverter and first push pull amplifier; and

a third inverter, receiving the input signal as applied to the first inverter and inverting it and connected to apply the inverted input signal as an input signal to the second inverter and the second push pull amplifier.

3,927,335
MONOLITHIC INTEGRABLE SERIES STABILIZATION CIRCUIT

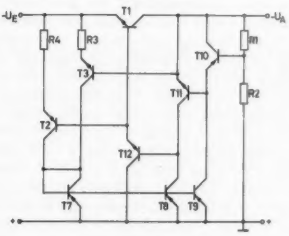
Hans Keller, and Herbert Elmis, both of Gundelfingen, Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed June 27, 1974, Ser. No. 483,486

Claims priority, application Germany, Aug. 2, 1973, 2339150

Int. Cl.² H03K *17/00*

U.S. Cl. 307—296 **4 Claims**



1. A monolithic integrable series stabilization circuit for generating a constant stabilized output voltage in the order of one volt, from an unstabilized input voltage, particularly wherein the voltage of dry-cell batteries serve as the supply voltage of a temporarily connected load, in which the emitter of a series transistor is connected to an input terminal, and the collector thereof to an output terminal of the series stabilization circuit and wherein the base current of said series transistor is controlled by a regulating amplifier by comparing a portion of the stabilized output voltage as taken off an ohmic voltage divider with a reference voltage, wherein said regulating amplifier is a three-stage amplifier including first and second transistors forming an asymmetrical differential amplifier stage, a third transistor forming the first stage and a fourth transistor forming the third stage, wherein the improvement comprises:

a first additional transistor of the same conductivity type as said series transistor having base, emitter and collector terminals, said base terminal coupled to the base of said series transistor and said collector terminal coupled to said regulating amplifier for supplying said regulating amplifier with current;

a first resistor coupled between the emitter of said first additional transistor and the emitter of said series transistor;

a second additional transistor of a conductivity type opposite to that of said series transistor having base, emitter and collector terminals, said collector terminal coupled to the bases of said series transistor and said first additional transistor and said emitter terminal coupled to the collector of said series transistor and to said regulating amplifier;

a second resistor coupled between the base of said second additional transistor and the emitter of said series transistor;

an emitter-follower transistor having conductivity type complementary to that of said series transistor, said emitter-follower transistor having a base coupled to the tapping point of said voltage divider, a collector coupled to the collector of said series transistor, and an emitter coupled to the base of said third transistor; and

a third additional transistor having a collector coupled to the emitters of said first and second transistor for supplying emitter current to said asymmetrical differential amplifier, said third additional transistor having a base coupled to the base of said series transistor and having an emitter coupled to the emitter of said series transistor, the base of said third transistor and the base of said first transistor supplied with current via a current mirror circuit.

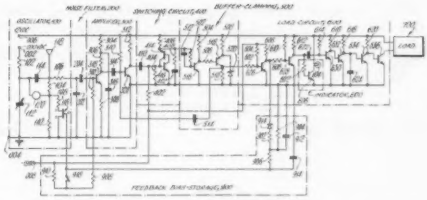
3,927,336
SELF-ADJUSTING CONDITION-RESPONSIVE CONTROL CIRCUIT

Paul A. Carlson, New Providence, N.J., and Arthur F. Cake, Greenwich, Conn., assignors to Wagner Electric Corporation, Parsippany, N.J.

Filed Mar. 27, 1974, Ser. No. 455,064

Int. Cl.² H01L *31/00;* **G05D** *23/19*

U.S. Cl. 307—308 **20 Claims**



1. A self-adjusting condition responsive control circuit comprising:

a. first circuit means operative in response to a control signal to provide a continually varying signal to compensate for slow variations from a reference level of a monitored parameter, and further operative to further vary said continually varying signal responsive to rapid variation from said reference level of said monitored parameter;

b. second circuit means operative to generate first and second signals in response to predetermined limits of said continuously varying signal;

c. third circuit means operative to clamp said first signal at a predetermined value; and

d. fourth circuit means operative to receive said clamped signal and provide said control signal for said first circuit means.

3,927,337
MAGNETO HYDRODYNAMIC GENERATOR

Milton T. Dooley, Florence, Ala., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 458,341, April 5, 1974. This application Dec. 12, 1974, Ser. No. 532,061

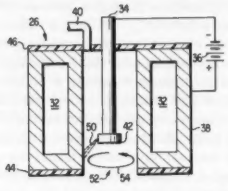
Int. Cl.² H02K *45/00*

U.S. Cl. 310—11 **17 Claims**

1. An MHD system of the type including means for directing a hot fluid through a Hall-type duct comprised of a plurality

of electrically conductive sections separated by electrically insulating sections, and means for applying a magnetic field across said duct, said system further including:

a plasma jet electrode located in one of said conductive sections;



said plasma jet electrode having an orifice, an emitter, a collector, and means for passing an ionizable gas between said emitter and collector and out of said orifice; and

circuit means for electrically biasing said emitter with respect to said collector and striking an arc between said emitter and collector, said arc being rotatable about said orifice by influence of said magnetic field.

3,927,338

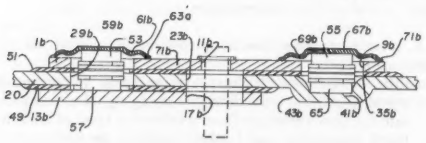
AUTOMOTIVE BRIDGE ASSEMBLY

Henry Vieilleribiere, Colomiers, France, assignor to Motorola, Inc., Chicago, Ill.

Filed Jan. 2, 1975, Ser. No. 538,230

Int. Cl.² H02K *11/00*

U.S. Cl. 310—68 D **11 Claims**



1. A rectifier bridge assembly, comprising:

a positive heat sink member having at least one aperture and one recessed region and being formed as a single unit with a first side and a second side;

a negative heat sink member positioned under said aperture, and said negative heat sink being attached to the first side of said positive heat sink member and being insulated therefrom;

a phase input plate having at least a pair of apertures, one of said apertures being in registration with said aperture carried by said positive heat sink member, the second of said apertures being in registration with said recessed region carried by said positive heat sink member, and said phase input plate being attached to the second side of said positive heat sink member and being insulated therefrom; a rectifying diode being positioned in each aperture carried by said phase input plate; and

sealing means for individually holding each of said diodes in contact with its respective heat sink and for individually holding each of said diodes away from the other heat sink.

3,927,339

FREQUENCY TRANSMITTERS FOR PRODUCING CONTROL SIGNALS CONTROLLING THE BRAKE FORCE IN MOTOR VEHICLE WHEELS

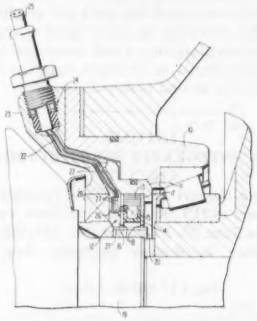
Jurgen Paul; Walter Kostelezky, both of Stuttgart, and Paul Schwerdt, Schnait, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Continuation of Ser. No. 312,512, Dec. 6, 1972. This application Aug. 28, 1974, Ser. No. 501,359

Claims priority, application Germany, Dec. 7, 1971, 2160536

Int. Cl.² H02K *21/38*

U.S. Cl. 310—155 **34 Claims**



1. A frequency transmitter for the generation of signals which is combined with a differential gear assembly, characterized in that a bearing cover means is provided at each output shaft of the differential gear assembly, an annular insert means is non-rotatably inserted along the axis of each output shaft from the outside of the differential gear assembly into the bearing cover means, said annular insert means including a coil carrier as well as two stationary toothed means and a permanent magnet of high energy yield, and in that a rotating toothed means is secured at the circumference of each output shaft of the differential gear assembly and cooperates with said two stationary toothed means to generate signals representative of the rotational speed of each output shaft.

3,927,340

IMAGING TARGET FOR PHOTOCONDUCTION TYPE IMAGE PICKUP DEVICE

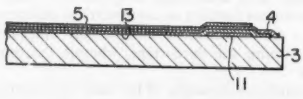
Hirofumi Suzuki, Mobara, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 21, 1974, Ser. No. 434,780

Claims priority, application Japan, Feb. 9, 1973, 48-15652; Feb. 9, 1973, 48-15653

Int. Cl.² H01J *29/36, 31/38*

U.S. Cl. 313—371 **24 Claims**



1. An imaging target for a photoconduction type image pickup device, comprising a transparent face plate, a light-shielding material film provided on at least a part of the portion of the inner surface of said face plate excepting the effective imaging section of said face plate, a transparent conductive film provided over said face plate and said light-shielding material film, a photoconductive film provided on said transparent conductive film at least over the effective imaging section of said face plate, and a light-permeable protection

film of a material non-corrodible to a treating solution corroding said photoconductive film, said light-permeable protection film being provided at least between said light-shielding material film and said transparent conductive film and being provided directly on said light shielding material film.

3,927,341

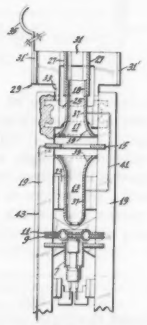
CATHODE RAY TUBE GUN HAVING NESTED ELECTRODE ASSEMBLY

Richard Henry Hughes, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 857,371, Sept. 12, 1969, abandoned. This application Sept. 9, 1971, Ser. No. 179,154

Int. Cl.² H01J *29/51, 31/20*

U.S. Cl. 313—412 **10 Claims**



1. In a unitary plural gun assembly, each gun comprising a plurality of axially-aligned electrodes mounted in spaced relation along elongated insulating support means for projecting an electron beam along a beam path in a forward direction, and a pair of magnetic pole pieces disposed primarily in a region beyond the forward end of the forwardmost electrode and on opposite sides of the beam path through said gun; the improvement wherein said pole pieces of each gun are disposed entirely outside of the last electrode, the major portions of said pole pieces extend along the beam path in the region located beyond said forwardmost electrode, and each gun includes a combination magnetic shield and electrode support member comprising a single piece of magnetic metal mounted on at least one of said support means and having a first portion attached to said last electrode, and a second portion spaced axially from said first portion, disposed in said region and extending between said pole pieces of that gun and the pole pieces of the other gun or guns for partially shielding the pole pieces of adjacent guns from each other.

3,927,342

CAPILLARY TUBE GAS DISCHARGE DEVICE

Wolfgang W. Bode, Sylvania; Glenn H. Dunlap, Maumee; Anthony M. Kobylak, Rossford; Raymond S. Richards, and Lawrence V. Pfaender, both of Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 819,641, April 28, 1969, Pat. No. 3,602,754. This application Nov. 2, 1970, Ser. No. 86,094

Int. Cl.² H01J *61/16, 61/30*

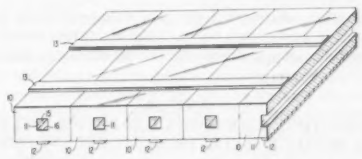
U.S. Cl. 313—188 **11 Claims**

6. A gas discharge element consisting essentially of an elongated redrawn glass capillary tube,

said tube having an internal diameter under about 10 mils, a wall thickness of about 1 mil,

means sealing the ends of said capillary tube, a gas discharge medium in said tube at a pressure sufficient to confine charges produced during discharges to a discrete volume of gas and permit side-by-side discrete discharges in said gas, and

a first conductor means on an exterior wall of said capillary tube, said conductor extending substantially the length of said capillary tube, said discharge element being adapted for assembly with a plurality of similar capillary tubes in



parallel coplanar relation and to have applied thereto, when in said parallel coplanar relation, a plurality of second conductor means, each common to a plurality of said tubes in said parallel relation.

3,927,343

WALL-STABILISED HIGH-PRESSURE MERCURY VAPOUR DISCHARGE LAMP CONTAINING IODIDE

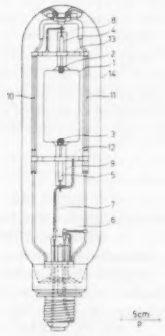
Louis Benjamin Beijer; Antonius Jozephus Gerardus Cornelis Driessen, and Cornelis Adrianus Joannes Jacobs, all of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Mar. 23, 1971, Ser. No. 127,256

Claims priority, application Netherlands, Apr. 13, 1970, 7005294

Int. Cl.² H01J *61/073, 61/20, 61/30*

U.S. Cl. 313—214 **2 Claims**



1. In a wall-stabilised high-pressure mercury vapour discharge lamp having a lamp voltage of from 50 to 300 volts which in addition to mercury and a rare gas in a cylindrical discharge space contains iodide of at least one of the elements sodium, lithium, thallium, indium, tin and dysprosium, the improvement comprising that the distance between the electrodes and the diameter of the cross-section of the discharge space have dimensions such that the equations:

1) $$6 \leqslant \frac{V}{L} \leqslant 39 - 6.5 \frac{L}{D}$$

2) $$1 \leqslant \frac{L}{D} \leqslant 4$$

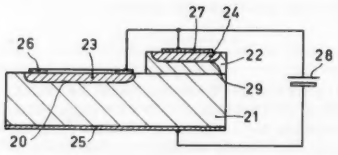
are satisfied, wherein V is the lamp voltage in Volts, L is the distance in centimeters between the electrodes and D is the internal diameter in centimeters of the discharge space.

3,927,344

MONOLITHIC SEMICONDUCTOR DEVICE INCLUDING A PROTECTED ELECTROLUMINESCENT DIODE

Jacques Lebailly, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 2, 1974, Ser. No. 485,202
Claims priority, application France, July 3, 1973, 73.24413
Int. Cl.[2] H01L *33/00;* **H05B** *33/02*
U.S. Cl. 313—499 **13 Claims**



1. A monolithic semiconductor device comprising an electroluminescent diode and a parallel diode electrically connected in the same direction as said electroluminescent diode and parallel therewith, the p-n junction of said parallel diode having an internal potential difference substantially greater than the voltage corresponding to the minimum energy of the radiation recombination junction of said electroluminescent diode and the dynamic admittance of said parallel diode being substantially greater than the dynamic admittance of said electroluminescent diode, at least in the operating region of maximum desired light power, whereby the current passed by said parallel diode relative to the current passed by said electroluminescent diode during forward biasing of said diodes is not significant except in the operating region of maximum desired light power where said substantially greater dynamic admittance of said parallel diode results in said parallel diode passing an increasing percentage of the current at higher bias levels protecting said electroluminescent diode from overloading.

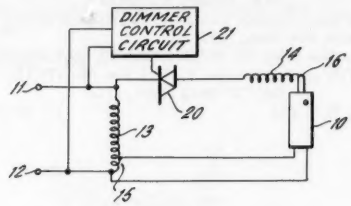
3,927,345

FLUORESCENT DIMMING CIRCUIT WITH D-C FLICKER ELIMINATION

Joseph Licata, Schnecksville; George S. Bartley, Allentown, and John E. Longenderfer, Orefield, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Aug. 16, 1973, Ser. No. 388,978
Int. Cl.[2] H05B *37/00*
U.S. Cl. 315—DIG. 5 **5 Claims**

1. A controlled energizing circuit for a gas discharge lamp; said energizing circuit including an a-c power source, an inductive ballast, a bidirectional controllably conductive device, and a phase control circuit for controlling the points in the positive and negative half waves of said a-c power source at which said bidirectional controllably conductive device begins to conduct; said ballast coupling said a-c power source to said gas discharge lamp; said bidirectional controllably conductive device being connected in series with said lamp and permitting current flow to said lamp only after said bidirectional controllably conductive device is fired; said phase control circuit including trigger circuit means for applying a firing signal to said bidirectional controllably conductive device; a charging circuit coupled to said trigger circuit means for operating said trigger circuit means when said charging circuit is charged to a given voltage, and an input reference voltage circuit for driving said charging circuit; said input reference voltage circuit including an adjustable resistor means having a wiper arm and first and second oppositely poled diodes having first terminals connected to the opposite ends of said adjustable



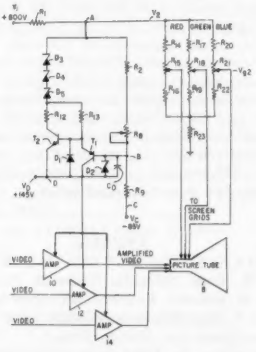
resistor means; second terminals of said oppositely poled diodes and said wiper arm, respectively, being connected to said a-c power source; said input reference voltage circuit defining separate reference voltages to said charging circuit for positive and negative half waves, respectively, of said a-c power source, whereby adjustment of said wiper arm of said adjustable resistor means is adjustable to compensate against the asymmetric firing of said bidirectional controllably conductive device.

3,927,346

SYSTEM FOR STABILIZATION OF WORKING POINT IN PICTURE TUBES

Dieter Spannhake, Darmstadt, Germany, assignor to Robert Bosch Fernsehanlagen GmbH, Darmstadt, Germany

Filed Oct. 5, 1973, Ser. No. 403,987
Claims priority, application Germany, Oct. 11, 1972, 2249703
Int. Cl.[2] H01J *29/52*
U.S. Cl. 315—30 **6 Claims**



1. A system for stabilization of the working point of a picture tube including a cathode and a screen grid, comprising

A. a video amplifier (**10**) powered from a high-tension direct voltage source (V_D) and amplifying a video signal for control of the cathode of a picture tube (**8**),

B. an adjustable voltage divider (R_{14}–R_{23}) driven by a second direct voltage source (V_2) for providing a divided direct voltage (V_{g2}) for application to screen grids of the picture tube, and

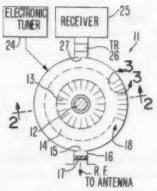
C. adjusting means (T_1,T_2) directly responsive to change in the magnitude of the voltages from the high-tension volt-

age source (V_D) and from the second voltage source (V_2) with respect to a reference voltage (V_c) for adjusting the direct voltage level of the second direct voltage source, whereby changes in the high-tension direct voltage source are compensated for by the effect on the picture tube of the change in throughgrip which results from adjustment of the second direct voltage source.

3,927,347
MICROWAVE TUBE USING ELECTRONICALLY TUNABLE CAVITY RESONATOR

George K. Farney, Boxford, Mass., assignor to Varian Associates, Palo Alto, Calif.

Filed Mar. 22, 1974, Ser. No. 453,667
Int. Cl.² H01J *25/50*
U.S. Cl. 315—39.55 **15 Claims**



1. An electronically tunable microwave coaxial magnetron including:

a cavity resonator dimensioned and arranged to support a circular electric mode of resonance,

a curved array of discrete reactive loading elements coupled to said circular electric mode of said cavity resonator, each of said discrete reactive loading elements having a reactance which is selectively variable between a minimum reactance and a maximum reactance,

means for exciting said cavity with microwave energy in said circular electric mode,

means for electronically varying said reactance of respective individual ones of said loading elements for tuning the resonant frequency of said cavity resonator in a stepwise fashion.

3,927,348
CONTROL CIRCUITS FOR AUXILIARY LIGHT SOURCE FOR USE WITH HIGH INTENSITY DISCHARGE LAMPS

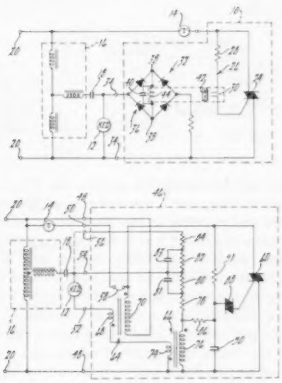
Andrzej Zawadski, Birmingham, Mich., assignor to Ram Meter, Inc., Ferndale, Mich.

Filed July 17, 1973, Ser. No. 379,935
Int. Cl.² H05B *39/10*
U.S. Cl. 315—88 **49 Claims**

1. A control system for an auxiliary lamp for providing supplemental lighting for a high intensity discharge lamp, said discharge lamp being connectable to a source of electric power to establish a voltage thereacross and having a normal mode of operation in which the luminescence of said high intensity discharge lamp is at a high level and the voltage thereacross is at an intermediate level and start-up and cool-down modes of operation in which the luminescence of said high intensity discharge lamp is at a reduced level relative to said high level of luminescence and the voltage thereacross is at low and high levels, respectively, comprising:

controlled conduction means having a control terminal for receiving a control signal for connecting said auxiliary lamp to an electric power source for said auxiliary lamp to light said auxiliary lamp; and

single control means connected to receive the voltage across said high intensity discharge lamp so as to be responsive to said start-up and said cool-down modes of operation of said high intensity discharge lamp for providing said control signal to said control terminal of said controlled conduction means to light said auxiliary lamp during at least portions of said start-up and said cool-down modes of operation of said high intensity discharge lamp whereby said auxiliary lamp provides supplemental lightening when the level of said luminescence of said high intensity discharge lamp is reduced, said single control means including switch means connected to said control terminal of said controlled conduction means which provides said control signal when closed and terminates said control signal when opened, and means for operating said switch including a first source of magnetic flux which has a flux magnitude which is effective to close said switch means during said start-up mode of operation, and a second source of magnetic flux which receives the voltage across said high intensity discharge lamp to provide a magnetic flux which is in opposition to said mag-



netic flux of said first source and which has a low flux magnitude which is ineffective to overcome said switch closing flux magnitude of said first source in response to said low voltage level across said high intensity discharge lamp representative of said start-up mode of operation of said high intensity discharge lamp so that said switch remains closed, which has an intermediate flux magnitude which is effective to overcome said switch closing flux magnitude of said first source to open said switch means in response to said intermediate voltage level across said high intensity discharge lamp representative of said normal mode of operation of said high intensity discharge lamp, and which has a high flux magnitude which is effective to close said switch means in response to said high voltage across said high intensity discharge lamp representative of said cool-down mode of operation of said high intensity discharge lamp.

3,927,349
ZERO CROSSING SCR LIGHT DIMMER

Glen D. Suhren, Dallas, and Charles W. True, III, Garland, both of Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 11, 1974, Ser. No. 460,230
Int. Cl.² H05B *37/00*
U.S. Cl. 315—205 **11 Claims**

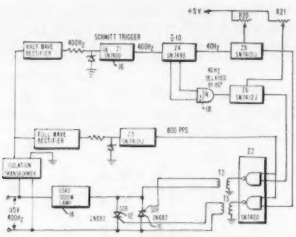
1. A zero crossing SCR light dimmer apparatus comprising in combination:

a power source connected to a high wattage lamp to supply power thereto, said power source having a frequency of 400 Hz, said lamp having a parallel pair of silicon controlled rectifiers in series with said power source, said

silicon controlled rectifiers being connected in opposite directions, one of said silicon controlled rectifiers being a positive SCR and the other a negative SCR,

means for controlling the positive half cycles of power being connected to said positive SCR, said positive controlling means turning said positive SCR on at a predetermined time,

means for controlling the negative half cycles of power being connected to said negative SCR, said negative controlling means turning said negative SCR on at a predetermined time,



means for synchronizing the application of power from said positive and negative controlling means connected to said positive and negative controlling means, said synchronizing means providing a synchronizing signal to said positive and negative controlling means, and,

a control unit connected to said positive and negative controlling means, said control unit providing a control signal to said positive and negative controlling means, said positive and negative controlling means respectively providing a positive half cycle of power and a negative half cycle of power when said synchronizing signal and said control signal coincide.

3,927,350

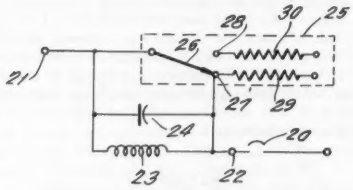
SELF-SWITCHED INDUCTIVE FAULT CURRENT LIMITER

Lorne D. McConnell, Chalfont, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Apr. 22, 1974, Ser. No. 462,781

Int. Cl.² H02H *7/22*

U.S. Cl. 317—11 C **7 Claims**



1. A fault current limiter for connection in an electric power circuit, and in series with a circuit breaker in said electric power circuit; said fault current limiter comprising an inductor, a capacitor, and a switching device; said switching device having interrupting capability; said inductor, capacitor and switching device being connected in parallel with one another; said switching device being operable between an open circuit condition and a closed circuit condition; operating means associated with said switching device and coupled to the current in said electric power circuit for maintaining said switching device in its said closed circuit condition when a circuit parameter in said electric power circuit is at or below a given value, and for operating said switching device to its said open circuit condition when said circuit parameter exceeds said given value; said electric power circuit having a given frequency; said capacitor and said inductor being resonant at a frequency substantially higher than said given frequency; said electric power circuit frequency being from 50 to 60 hertz; said capacitor having a capacitive reactance of about 10 times or more than the inductive reactance of said inductor.

3,927,351

INSULATED PIPE SYSTEMS WITH MOISTURE DETECTING MEANS

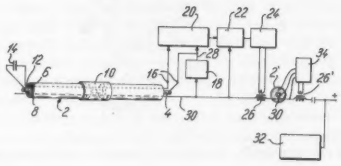
Ejvind Lambertsen, Fredericia, Denmark, assignor to A/S E. Rasmussen, Denmark

Filed Mar. 26, 1974, Ser. No. 454,952

Claims priority, application United Kingdom, Mar. 26, 1973, 14316/73

Int. Cl.² H02H *3/38*

U.S. Cl. 317—27 R **10 Claims**



1. An insulated pipe system such as a subterranean district heating pipe system comprising a conductor pipe surrounded by a normally dry and electrically non-conducting, but hygroscopic material in which there is enclosed elongated electric conductor elements connected to means for detecting the occurrence of an electric conductivity in the hygroscopic material due to intrusion of moisture therein, characterized in that the conductor elements between which the conductivity should be detected are connected to an alternate voltage source and are mutually connected so as to form a complex impedance, the real part of which is constituted by the resistance between the conductor elements through the hygroscopic material, the detecting means comprising a phase comparator connected so as to compare the phase of the output signal from the alternate voltage source with the phase of the signal through the complex impedance and to actuate a detector unit in response to the phase difference between the compared signals changing beyond a predetermined value.

3,927,352

LOGIC SYSTEM FOR PROTECTING TRANSISTORS

Douglas S. Schatz, Santa Clara, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed May 22, 1974, Ser. No. 472,193

Int. Cl.² H02H *7/122*

U.S. Cl. 317—27 R **9 Claims**

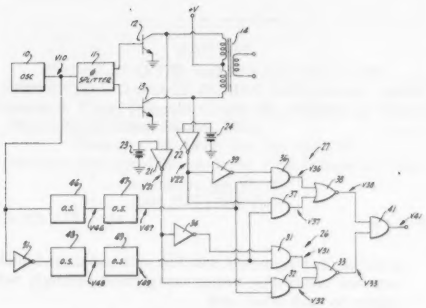
1. In a system for detecting a malfunction in the operation of a switching transistor turned on and off cyclically to produce a power output signal which oscillates between first and second predetermined levels at a predetermined rate:

A. means for providing first and second timing signals defining first and second sampling periods during portions of alternate half cycles of the output signal; and

B. logic gate means for monitoring the level of the output signal and providing a fault signal in the event that the level differs from the first or second predetermined level during the first and second sampling periods, respectively, said logic gate means comprising:

1. a first AND gate receiving inputs corresponding to the first timing signal and the output signal;

2. a second AND gate receiving inputs corresponding to the second timing signal and the inverse of the output signal; and



3. an additional gate having inputs connected to the outputs of the AND gates.

3,927,353

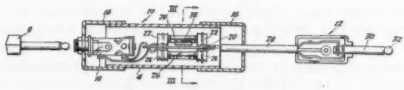
PROTECTIVE DEVICE AND METHOD FOR USE WITH AUDIO AMPLIFICATION EQUIPMENT

John S. Reid, 10 Boston Ave., Benton Lodge, Newcastle upon Tyne, and Christopher W. J. Hayes, 8 Hector St., Shiremoor, both of England

Filed June 29, 1973, Ser. No. 375,091

Int. Cl.² H02H *3/08*

U.S. Cl. 317—40 A **2 Claims**



1. A means for protecting a user of audio amplification equipment against electric shock, said equipment comprising an amplifier, apparatus producing a signal to be amplified, and coaxial cable means for electrically connecting said amplifier to said apparatus, the coaxial cable means having a core circuit and a sheath circuit, and the protecting means comprising fuses, located respectively in said core and said sheath circuits between said amplifier and said apparatus, for isolating the user of the apparatus from the amplifier so that any current passing from the amplifier through the user to ground must pass through said fuses said fuses being such as will be broken by a current less than likely to cause more than superficial injury to a person, both said fuses being mounted in a single separable unit having two ends, there being a jack socket at one end and a first jack plug at the other, said jack plug being rotationally symmetrical and having a tip contact connected through one of said fuses to a contact of the jack socket in contact with the tip contact of a second jack plug, similar to the first, inserted into said jack socket, and a cylindrical sleeve contact connected through the other of said fuses to a contact of the jack socket in contact with the sleeve contact of said second jack plug, said second jack plug being connected by said coaxial cable means to said apparatus, and said first jack plug being inserted into a matching jack socket in said amplifier.

3,927,354

DEVICE FOR GENERATING ELECTRIC SPARKS FOR IGNITING FLAMMABLE VAPORS CONTAINING GAS AND AIR

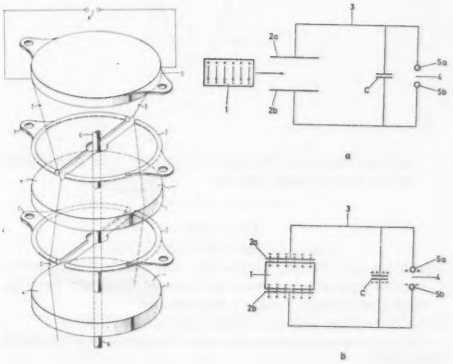
Herbert Bauser, Friedrichsdorf, and Dieter Fischer, Frankfurt am Main, both of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 19, 1974, Ser. No. 490,213

Claims priority, application Germany, July 23, 1973, 2337347

Int. Cl.² F23Q *3/01*

U.S. Cl. 317—81 **1 Claim**



1. A device for generating an electric spark for the ignition of gas-air mixtures comprising a circuit including a condenser, a pair of electrodes connected between terminals of said condenser forming a spark gap, a pair of conductive plates connected between said terminals, a plurality of electrets in the form of thin disks rotatably supported on a shaft, each disk having a segment of one polarity and another segment of a polarity opposite thereto comprising two sets of semi-circular disk members insulated from each other, one of said sets being connected to one terminal of said condenser and the other set to the other terminal thereof whereby, upon 90° rotation of said electrets, said sets of disk members receive a charge of opposite polarity, causing a cumulative charge transfer on said condenser, resulting in a spark discharge between said pair of electrodes.

3,927,355

DIODE STACK WITH SEGMENTED MOUNTING PLATE

Frank S. Parker, Bay City, Mich., assignor to Newcor, Inc., Bay City, Mich.

Filed Feb. 25, 1974, Ser. No. 445,481

Int. Cl.² H01L *23/34*

U.S. Cl. 317—100 **10 Claims**

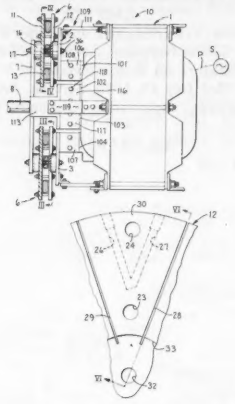
1. A rectifier unit, comprising:

a spaced pair of substantially parallel mounting plates having a plurality of diode stacks positioned therebetween, one of said plates comprising slots through the thickness thereof and between adjacent diode stacks, and interconnected, substantially axially flexible segments facing said diode stacks and having edges separated by said slots;

means clamping said plates fixedly with respect to each

stack of diodes;

whereby the flexing of the segments of the segmented plate



will accommodate the same to varying axial dimensions of the several diode stacks.

3,927,356
YARN DETECTION DEVICES

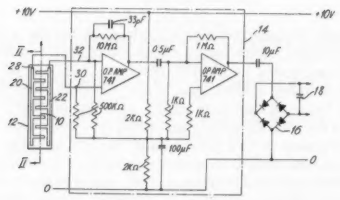
David George Hodson, Sherwood, and Derek Peat, Aspley, both of England, assignors to National Research Development Corporation, London, England

Filed July 11, 1974, Ser. No. 487,759

Claims priority, application United Kingdom, July 13, 1973, 33564/73

Int. Cl.² H01H *47/00*

U.S. Cl. 317—123 **12 Claims**



1. A detection apparatus comprising a multi-electrode detector for detecting static charge on a moving yarn or the like, an amplifier for amplifying signals produced by the detector on detection of said charge, and a cut-off unit adapted to pass signals from the amplifier in excess of some predetermined amplitude which is greater than that associated with electronic noise in the cut-off unit input signal.

3,927,357
ELECTRIC VEHICLE POWER CIRCUIT

Charles Edward Konrad, Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Apr. 1, 1974, Ser. No. 456,466

Int. Cl.² H02P *5/16*

U.S. Cl. 318—139 **9 Claims**

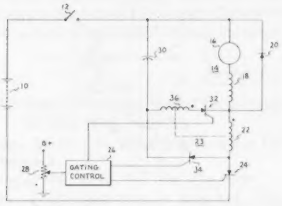
1. A pulse control system for controlling the power applied to a dc load from a dc source, comprising:

switching means for periodically coupling the dc load to the dc source, the mark-space ratio of conductivity of said switching means determining the percentage of source voltage which appears across the load;

the series combination of a capacitor, inductive means and first unidirectional conducting means;

means for coupling said series combination across the load;

second unidirectional conducting means coupled in parallel with said inductive means and said first unidirectional conducting means, said first and said second unidirectional conducting means being poled inversely with respect to each other; and



control means for sequentially enabling said switching means and at least one of said first or said second unidirectional conducting means.

3,927,358
ELECTRIC MOTORS

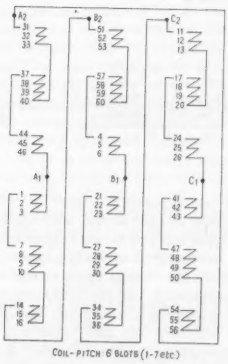
Alexander Richard William Broadway; William Fong, and Gordon Hindle Rawcliffe, all of Bristol, England, assignors to National Research Development Corporation, London, England

Filed Apr. 1, 1974, Ser. No. 456,857

Claims priority, application United Kingdom, Apr. 13, 1973, 17943/73

Int. Cl.² H02K *17/14*

U.S. Cl. 318—224 **13 Claims**



1. A three-phase alternating current, speed-changing rotary machine, comprising an electric motor or generator, wherein speed-changing from a first operating pole-number to a second operating pole-number is effected by the method of pole amplitude modulation, said machine having a stator winding comprising three phase-windings wound on a stator frame in a layout defining said first operating pole-number, said layout defining a pole-amplitude modulation wave extending around the circumference of each phase-winding wherein the poles in alternate half-cycles of the said wave are reversed in polarity to provide the said second operating pole-number, the phase-winding coil-group distribution providing the poles of the said first pole-number comprising substantially equi-angularly spaced-apart coil-groups of sequentially varying amplitude which approximates a sinusoidal amplitude distribution within

each modulating wave half-cycle, the said distribution including coil-group locations, substantially equi-angularly spaced-apart from adjacent coil-groups comprising zero-number coil groups positioned substantially at the zero-amplitude positions defined by the said sinusoidal amplitude distribution of the said modulating wave.

3,927,359

ENGINE STARTER MOTOR CONTROL FOR PREVENTING DAMAGE DURING HYDRAULIC LOCK

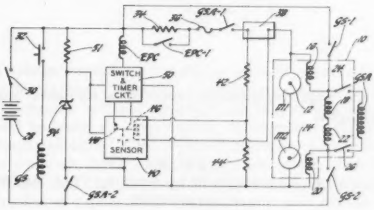
Stephen S. Chen, Downers Grove, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 15, 1973, Ser. No. 415,977

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H02P *7/14*

U.S. Cl. 318—434 **2 Claims**



2. An engine starter motor control for preventing damage to an engine when said engine experiences a hydraulic lock due to fluid contained in a cylinder thereof, comprising: a starter motor effective for cranking the engine; a starter motor energizing circuit including a DC power source, a parallel circuit comprised of an impedance and a speed control contacter, and a starter contacter series coupled with the starter motor, the starter motor being coupled directly to the DC power source when the starter contacter and the speed control contacter are closed so as to crank the engine at maximum speed with maximum applied torque and being coupled to the DC power source through the starter contacter and the impedance when the speed control contacter is opened so as to crank the engine at a rate below a specified speed at which the applied torque is insufficient to rotate the engine when said engine experiences a hydraulic lock; means for generating a first signal directly related to the magnitude of current through the starter motor; means for generating a second signal directly related to the magnitude of the voltage across the starter motor; means responsive to the first and second signals for generating a third signal having a magnitude directly related to the speed of the starter motor; means responsive to the third signal for closing the contacter when the magnitude of said signal represents a speed of the starter motor less than specified speed and opening the contacter when the speed is greater than the specified speed; and timer means for disabling the last mentioned means from opening the contacter when the speed of the starter motor is greater than the specified speed after a predetermined time duration from the closing of the starter contacter, said time duration being at least equal to the time required for the starter motor when operating at the specified speed to rotate the engine through one complete revolution, whereby the starter motor cranks the engine at or below the specified speed for the specified time duration with an applied torque insufficient to rotate the engine when said engine experiences a hydraulic lock.

3,927,360

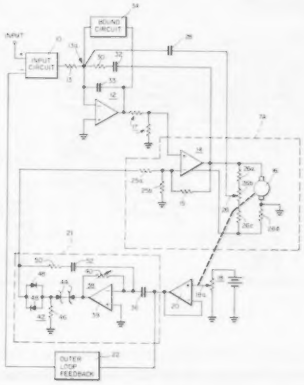
NULL-BALANCE SERVO SYSTEM

Samuel Jay MacMullan, Newtown, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Nov. 30, 1972, Ser. No. 310,819

Int. Cl.² G05B *5/01*

U.S. Cl. 318—619 **7 Claims**



1. A null-balance servo system for measuring an unknown electrical quantity as an input signal comprising:

an adjustable circuit element for generating a position feedback signal representing the adjustable position of said adjustable circuit element;

an input circuit responsive to an input signal and said position feedback signal applied thereto for generating an error signal representing the unbalance of said system;

signal processing amplifier means having an input coupled to the output of said input circuit;

power amplifier means having an input coupled to the output of said signal processing amplifier means and an output;

a motor coupled to said output of said power amplifier means for adjusting said adjustable circuit element in a direction to restore balance to said system;

means for reducing said error signal by small signal acceleration feedback and small signal velocity feedback signals, said small signal acceleration feedback signal being applied to the input of said signal processing amplifier;

means for reducing said error signal by large signal velocity feedback when said rate of change of said adjustable circuit element exceeds a predetermined threshold so as to establish a velocity controlled mode of operation for said system, said large signal velocity feedback signal being applied to the input of said power amplifier in proper phase relationship; and

means for decreasing the effect of at least one of said small signal feedback signals on said error signal relative to the effect of said large signal velocity feedback signal on said error signal when said large signal velocity feedback exceeds said threshold so as to permit the large signal velocity feedback to dominate said at least one small signal feedback thereby constraining the effective bandwidth of the system during said velocity controlled mode of operation, said means for decreasing the effect of said small signal feedback signals substantially limiting the small signal acceleration feedback that is applied to said signal processing amplifier when said rate of adjustment exceeds said threshold.

3,927,361
BATTERY CHARGERS

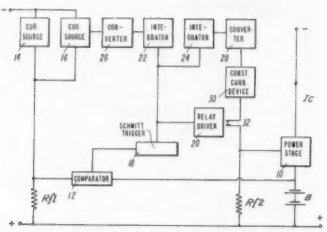
James Adrian Macharg, 16, Elmfield Park, Gosforth, Newcastle Upon Tyne, 3, England

Continuation-in-part of Ser. No. 827,182, May 23, 1969, Pat. No. 3,624,481. This application Jan. 21, 1971, Ser. No. 108,317

Claims priority, application United Kingdom, Jan. 27, 1970, 400170/70

Int. Cl.[2] H02J 7/10

U.S. Cl. 320—39 21 Claims



1. A battery charger, comprising reference means for deriving a reference voltage; comparator means for comparing the reference voltage with the actual voltage of the battery being charged; sensing means operable from said comparator means for sensing when the difference between the reference voltage and the battery terminal voltage is above or below a given value, said sensing means producing either a zero signal or a signal of a given value according to the result of the comparison between the reference voltage and the battery terminal voltage; integrator means operable from the output of the sensing means; battery charging circuit means; current control means in the battery charging circuit means, for varying the magnitude of the charging current as a function of the integrated output from said integrator means; reference voltage varying means responding to said integrator means for varying the value of the reference voltage between predetermined upper and lower limits as a function of the integrated output from the integrator means.

3,927,362
RECTIFIER CIRCUIT FOR PROVIDING SIX-PHASE RECTIFICATION OF THREE-PHASE ALTERNATING CURRENT

Roger F. Brewster, Santa Barbara, Calif., assignor to General Motors Corporation, Detroit, Mich.

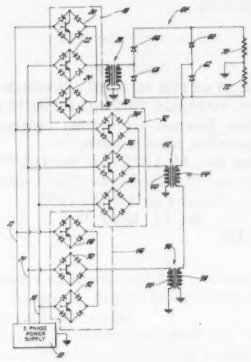
Filed Oct. 25, 1973, Ser. No. 409,657

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] H02M 7/155

U.S. Cl. 321—5 4 Claims

1. A rectifier circuit for converting a three-phase alternating signal output from a three-phase supply to a six-phase rectified unidirectional signal comprising: first, second and third phase selector means coupled to the three-phase supply, each of the phase selector means sequentially coupling each phase of the three-phase alternating signal to its output in 60 electrical degree segments, each phase of the three-phase alternating signal being coupled to the output of a respective one of the phase selector means at any instant in time and means coupled to the outputs of the first, second and third phase selector means for combining the positive 60 electrical degree segments coupled to the outputs of the first, second and third phase selector means and combining the negative 60 electrical degree segments coupled to the outputs of the first, second and third phase selector means, whereby the combined positive and negative segments comprise a six-phase unidirectional signal.



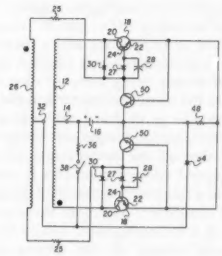
3,927,363
CURRENT LIMITED SELF-SATURATING DC/DC CONVERTER

Daniel M. Mitchell, and Robert H. Ternowski, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 10, 1975, Ser. No. 548,309

Int. Cl.[2] H02M 1/18

U.S. Cl. 321—11 4 Claims



1. A current limited self-saturating DC/DC converter comprising:

a transformer having a control winding and an input winding with a center tap for connection to one terminal of a DC power supply;

current sensing means for providing a cutoff signal whenever the current therethrough attains some predetermined level;

a pair of switching transistors, each having its collector-emitter path connected between a different end of the input winding of said transformer and the other DC power supply terminal via said current sensing means for passing current when enabled;

circuit means for connecting the bases of said switching transistors to opposite ends of the control winding of said transformer for alternately enabling said transistors via the DC power supply and said current sensing means, and cutoff circuit means connected to the bases of said

switching transistors for inhibiting the passage of current therethrough in response to said cutoff signal.

3,927,364

VOLTAGE MULTIPLIER ARRANGEMENT WITH CAPACITOR ROLLS SURROUNDED BY DIODES

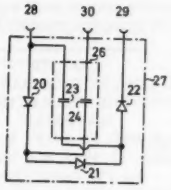
Werner Bauer, Nurnberg, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 17, 1974, Ser. No. 470,881

Claims priority, application Germany, June 4, 1973, 2328290

Int. Cl.[2] H02M *3/06;* **H01G** *4/38*

U.S. Cl. 321—15 **8 Claims**



1. A voltage multiplier comprising a plurality of series connected diodes and a plurality of capacitors, each capacitor being connected between opposite ends of a pair of said diodes and including an intermediate thermoplastic dielectric layer and a pair of metal foil electrode layers on opposite sides of said dielectric layer, said electrode and dielectric layers being rolled into a plurality of overlapping layers including said plurality of capacitors within a common roll, said diodes being connected to said electrode layers and being disposed about opposite outer sides of said roll.

3,927,365

SWITCH OPERATING DEVICE

Koji Kodama, Tokyo, and Yujiro Kasai, Ohme, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

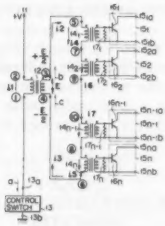
Filed Mar. 28, 1973, Ser. No. 345,527

Claims priority, application Japan, Mar. 31, 1972, 47-32465

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G05F *5/00*

U.S. Cl. 323—48 **8 Claims**



4. A switch operating device comprising a driving transformer having the input side thereof supplied with switching current; a first plurality of switching transformers whose primary sides are serially connected between one inout terminal of said driving transformer and the source of said switching current, a second plurality of switching transformers whose primary sides are serially connected between the output terminals of said driving transformer; and a plurality of switching circuits connected to the secondary sides of said first and second plurality of switching transformers.

3,927,366

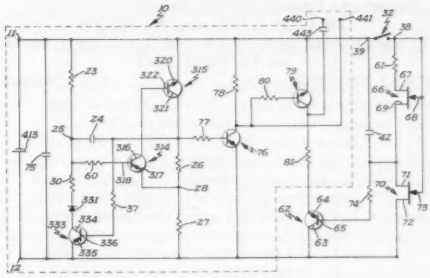
METHOD FOR DETERMINING THE END OF LIFE OF A PULSE GENERATOR POWER SOURCE

Pieter M. J. Mulier, St. Paul; Thomas L. Jirak, Plymouth, and Lawrence M. Kane, Roseville, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Division of Ser. No. 256,330, May 24, 1972, Pat. No. 3,857,085. This application Aug. 20, 1973, Ser. No. 390,174

Int. Cl. G01n *27/42*

U.S. Cl. 324—29.5 **6 Claims**



1. A method for determining the end of life of a pulse generator power source which comprises the steps of: providing an output regulating circuit means for the pulse generator; initiating the operating of the output regulating circuit means such that the voltage amplitude decreases in substantially constant decrements from one pulse to the next; sensing the effects of the decrease in voltage amplitude; counting the number of pulses from the time of initiating until the occurrence of a critical event; and determing the useful life remaining in the pulse generator power source.

3,927,367

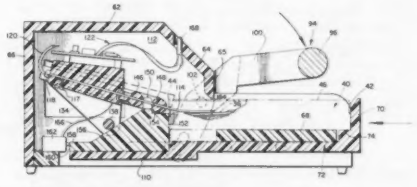
BATTERY TESTING APPARATUS

David M. Franklin, Lexington, and William P. Lane, Taunton, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 21, 1974, Ser. No. 516,645

Int. Cl.[2] G01N *27/42*

U.S. Cl. 324—29.5 **25 Claims**



1. Apparatus for testing the condition of a battery located within a multi-walled package and having spaced terminal defining surfaces of opposed polarity in predetermined orientation within said package, comprising:

probe means insertable through a select wall of said package for establishing electrically conducting contact with said terminal surfaces;

receiver means for removably receiving said package in a predetermined orientation aligning said select wall for said probe means insertion;

actuator means for providing relative movement between said multi-walled package means and said probe means to effect said probe means contact; and

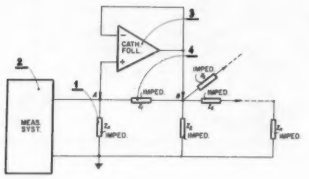
means electrically connectable with said probe means for indicating the condition of a said battery, the said terminal defining surfaces of which have been contacted by said probe means.

3,927,368

METHOD OF BREAKING ELECTRIC NETWORKS FOR MEASUREMENT OF PARAMETERS OF NETWORK COMPONENTS

Romuald Zielonko, Sopot; Jerzy Hoja, Gdansk-Wrzeszcz, and Henryk Wojciechowski, Gdansk, all of Poland, assignors to Politechnika Gdanska, Gdansk, Poland

Filed Apr. 4, 1974, Ser. No. 458,359
Claims priority, application Poland, Apr. 7, 1973, 161757
Int. Cl.[2] G01R *27/02*
U.S. Cl. 324—57 R **4 Claims**



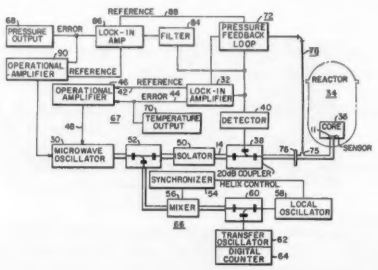
1. A method of isolating a network impedance element connected between two terminals in said network, said method comprising creating a virtual open circuit in said electrical network by transmitting a potential at one of said terminals by means of a high-input-impedance voltage follower whose amplification factor is close to unity to the other terminal.

3,927,369

MICROWAVE FREQUENCY SENSOR UTILIZING A SINGLE RESONANT CAVITY TO PROVIDE SIMULTANEOUS MEASUREMENTS OF A PLURALITY OF PHYSICAL PROPERTIES

Thomas R. Billeter, and Lee D. Philipp, both of Richland, Wash., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 31, 1973, Ser. No. 328,220
Int. Cl. G01r *27/04*
U.S. Cl. 324—58.5 C **16 Claims**



1. Apparatus for providing the simultaneous measurement of a plurality of physical properties of a given environment including:

a high frequency electromagnetic energy source capable of transmitting energy having a frequency varying within a given range of frequencies;

cavity resonator means comprising a single hollow member having a wall section responsive to one of the physical properties to be measured to move in a manner to change the effective dimension of the hollow cavity along a prescribed axis, said resonator means being designed to have a plurality of coexisting resonant frequency modes, within the given range of frequencies, corresponding to the plurality of physical properties being measured, said resonant frequency modes being respectively dependent upon a unique combination or permutation and collectively dependent on all of the properties being measured; means for communicating said energy from said source to said cavity to excite said cavity to resonate at said plurality of resonant frequency modes, said communication means further transmitting any reflected energy resulting thereby; and

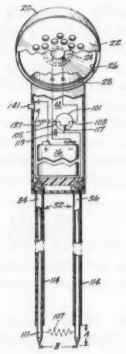
detection means responsive to said reflected energy to provide respective outputs each representative of one of the plurality of properties measured.

3,927,370

AUDIO SIGNALLING SYSTEM HAVING PROBES FOR MONITORING THE CHARACTERISTICS OF A MATERIAL

Bjorn N. De Bough, 8011 First N.E., Seattle, Wash. 98115

Filed July 11, 1972, Ser. No. 270,706
Int. Cl.[2] G01R *27/02*
U.S. Cl. 324—65 R **9 Claims**



5. A system for detecting the moisture content of soil at a predetermined depth comprising:

first and second insulated probes having exposed electrically conductive tip portions for positioning at said predetermined depth for detecting the path resistance of said soil at said predetermined depth between said tip portions;

an audio pulse signalling system coupled to said first and second probes for providing audio pulses at an increasing rate in response to decrease in resistivity of said soil and providing a zero audio pulse rate when said soil resistance between said probes is greater than about four kilohms.

3,927,371

TEST SYSTEM FOR LARGE SCALE INTEGRATED CIRCUITS

Jehoshua Naphtali Pomeranz, Suffern, and Henri Daniel Schnurmann, Monsey, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 19, 1974, Ser. No. 443,284
Int. Cl.[2] G01R *15/12, 31/30;* **G06F** *11/00*
U.S. Cl. 324—73 R **16 Claims**

1. A system for testing a complex logic circuit which may be characterized as a partially functional circuit comprising:

a source of a functional test pattern;

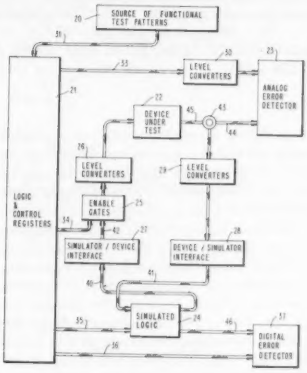
a logic simulator having functional properties complementary to said partially functional circuit;

means for selectively applying said test pattern to input terminals of said partially functional circuit and said logic simulator;

first interface means resonsive to signals from predetermined output terminals of said partially functional circuit for applying said output signals to related input terminals of said logic simulator;

second interface means responsive to signals from predetermined output terminals of said logic simulator for applying said output signals to related input terminals of said partially functional circuit;

said partially functional circuit and said logic simulator being interconnected by said first and second interface means to form a fully functional circuit; and



means responsive to output signals from the output terminals of both said partially functional circuit and said logic simulator for generating indications of the output signal pattern generated by said partially functional circuit and said logic simulator in response to said functional test pattern.

3,927,372

ARRANGEMENT FOR IMPROVING THE REPRODUCTION OF AMPLITUDE JUMPS DURING TRANSMISSION USING DIFFERENTIAL PULSE CODE MODULATION

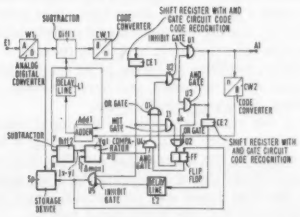
Willmut Zschunke, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 15, 1974, Ser. No. 514,862

Claims priority, application Germany, Nov. 7, 1973, 2355676

Int. Cl.² H04B 1/00

U.S. Cl. 325—38 B **3 Claims**



1. An arrangement for improving the reproduction of amplitude jumps in a differential pulse code modulation (DPCM) system comprising:

a transmitter including

a source of digital input signals,

a transmitter output,

a DPCM modulator having

a first subtractor having one input coupled to said source to provide a first output signal equal to the difference value between a present sample value and a preceding sample value, said first subtractor providing at least maximum difference value code words during said amplitude jumps for transmission, the output of said first subtractor being coupled to said transmitter output,

a first delay means having its output coupled to the other input of said first subtractor, said first delay means having a delay equal to one sampling interval, and

a first adder having one input coupled to the output of said first subtractor, the other input coupled to the output of said first delay means and its output coupled to the input of said first delay means,

a first means coupled to the output of said first subtractor, to provide a second output signal when said maximum difference value code words are detected,

a second means coupled to the output of said first subtractor to provide a third output signal when said maximum difference value code words are detected,

an inhibit gate coupled to the output of each of said first and second means,

said first and second means and said INHIBIT gate cooperating to provide a write instruction at the output of said INHIBIT gate for the condition "value to be transmitted equal to maximum difference value and previously transmitted value unequal to said maximum difference value",

a storage device coupled to said source and said INHIBIT gate responsive to said write instruction to store the value of the present one of said input signals,

a second subtractor coupled to said storage device and the output of said first delay means to subtract said stored value of the present one of said input signals from the value at the output of said first delay means to produce a remaining difference value,

a comparator coupled to said second subtractor to compare said remaining difference value with said maximum difference value, said comparator providing a fourth output signal when said remaining difference value is equal to or greater than said maximum difference value,

first logic circuitry coupled to said comparator and said first subtractor to enable transmission from said first subtractor of said maximum difference value code words when said fourth output signal is present, and

second logic circuitry coupled to said first logic circuitry and said transmitter output to cause transmission of a special code word rather than the value actually provided for transmission by said first subtractor when said fourth output signal is not present; and

a receiver including

a DPCM demodulator having

a second adder having a serial output and one input coupled to said transmitter output, and

a second delay means coupled between said serial output of said second adder and the other input of said second adder, said second delay means having a delay equal to said one sampling interval

a delay arrangement having several delay devices,

a third means coupled to said transmitter output to provide a fifth output signal when said maximum difference value code words are detected,

third logic circuitry coupled to said third means responsive to said fifth output signal to provide a control signal,

a counter coupled to said third logic circuitry, said counter being advanced one count position whenever

said control signal indicates two successive maximum difference value code words have been detected by said third means and being reset to its initial count position when said control signal indicates at least one code word representing value different that said maximum difference value has been detected by said third means, and

fourth logic circuitry coupled to said counter, each of said delay devices and said serial output to connect the first n of said delay devices to said serial output as a function of the count position n of said counter, where n is an integer greater than one, said fourth logic circuitry also preventing the value stored at all but the last one of said first n of said delay devices from being passed to the output of said delay arrangement.

3,927,373
PAGING SYSTEM

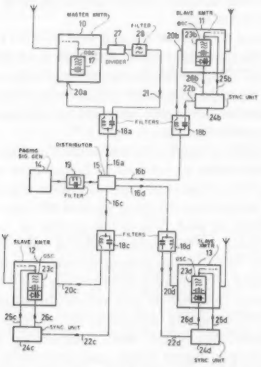
Abraham Janssens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 20, 1973, Ser. No. 417,550

Claims priority, application Netherlands, Nov. 23, 1972, 7215855

Int. Cl.[2] H03B *3/08*

U.S. Cl. 325—58 **2 Claims**



1. A paging system comprising a plurality of controlled transmitters each having an main oscillator means for generating carriers in the same frequency channel, the carriers being modulated by the same information, a controlling transmitter coupled to apply a synchronization signal to the controlled transmitters, the controlled transmitters each having a synchronization unit means for synchronizing the transmitter frequency to a multiple of the frequency of the synchronization signal, the synchronization unit of each of said controlled transmitters comprises an auxiliary oscillator, the frequency of which is lower by a factor *n* than the transmitter main oscillator frequency and is higher by a factor *m* than the frequency of the synchronization signal, a first frequency control circuit means coupled to said auxiliary oscillator for synchronizing the frequency of the auxiliary oscillator to the *m*-tiple of the frequency of the synchronization signal, said first control circuit comprising a first frequency divider which has the dividing factor *m* coupled to the output of said auxiliary oscillator, a first phase detector having a first input means for receiving the synchronization signal and a second input coupled to the first frequency divider output, and a first low pass filter coupled between the output of the phase detector and a control input of the auxiliary oscillator, and a second frequency control circuit means cascaded and independent with respect to said first control circuit means and coupled to said main oscillator for synchronizing the transmitter main oscillator frequency to the *n*-tiple of the frequency of the auxiliary oscillator, said second control circuit comprising a second frequency divider having the dividing factor *n* coupled to said main oscillator, a second phase detector which is coupled to the auxiliary oscillator and to said second divider, and a second low pass filter coupled between the output of the second phase detector and a frequency control input of the transmitter main oscillator, *m* and *n* being integer numbers larger than one.

3,927,374
SAMPLING OSCILLOSCOPE CIRCUIT

Naohisa Nakaya, Komae, Japan, assignor to Iwasaki Tsushinki Kabushiki Kaisha, Japan

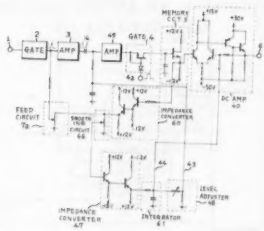
Filed Nov. 27, 1972, Ser. No. 309,681

Claims priority, application Japan, Nov. 29, 1971, 48-95236

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G11C *11/24;* **H03K** *5/00;* **Ho3K** *17/60*

U.S. Cl. 328—151 **6 Claims**



1. A sampling circuit for a sampling oscilloscope comprising:

a. a sampling gate circuit provided with input means for receiving an input signal to be sampled;

b. a sampling pulse generator connected to said sampling gate circuit for applying narrow sampling pulses thereto whereupon said sampling gate circuit gates the input signal to provide input signal samples as an output signal thereof;

c. an amplifier receptive of the input signal samples from said sampling gate circuit;

d. another gate circuit AC-coupled with an output of said amplifier for receiving the input signal samples;

e. a gate pulse generator receptive of sampling pulses developed by said sampling pulses generator for developing gate pulses in synchronism with the sampling pulses and applying said gate pulses to said another gate circuit for enabling said another gate circuit;

f. a memory circuit receptive of an input signal sample from said another gate circuit when said other gate circuit is enabled for storing the input signal sample until a subsequent input signal sample is applied thereto;

g. An output amplifier receptive of an input signal sample from said memory circuit and having output means for providing an output signal thereat;

h. feed circuit means receptive of the input signal sample from said memory circuit for developing a first signal proportional to the input signal sample and for developing a second signal proportional to the input signal sample where the first signal and the second signal are of the same proportion of the input signal sample;

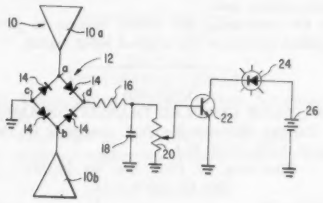
i. means for applying the first signal to said another gate circuit when a subsequent input signal sample is applied to said memory circuit; and

j. means for subtracting the second signal from an input signal sample applied to said output amplifier.

3,927,375
ELECTROMAGNETIC RADIATION DETECTOR

Bernard Lanoe, and Elisabeth de Metz, both of 65, boulevard Pasteur, Bruz, France

Filed Feb. 4, 1974, Ser. No. 439,123
Claims priority, application France, Feb. 16, 1973, 73.05457
Int. Cl.² H04B *17/00*
U.S. Cl. 325—363 **6 Claims**

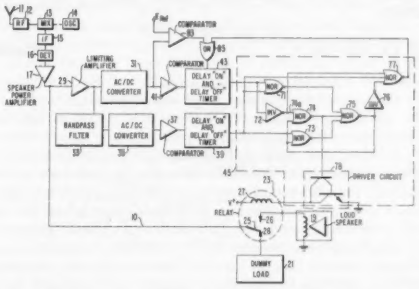


1. An electromagnetic radiation detector including an alarm device, the improvement comprising a receiving antenna for detecting radiation, a voltage detector connected to said antenna, a threshold amplifier switch connected to the output of said voltage detector, and a suitably polarized electroluminescent diode, connected to the output of said amplifier switch, serving as said alarm device, said receiving antenna comprising a dipole antenna including radiation receiving dipole elements, the components of said detector including said dipole elements being formed on a printed circuit card, said card including a first hole for housing said DC source, and a second hole for mounting said diode, said components being carried by the back of said card and printed circuit connections for said components being located on the front of said card, the device further comprising a cover located on the front of said card including an aperture therein through which said diode extends, said cover for said card including identity and work identification indicia thereon.

3,927,376
SPEAKER MUTING SYSTEM

Ronald Gilbert Ferrie, Pittsburgh, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 536,004
Int. Cl.² H04B *1/10*
U.S. Cl. 325—478 **10 Claims**



1. In a receiver system including an audio detector to detect voice audio intelligence signals and data audio tone intelligence signals at a given frequency within the voice band of frequencies, and means to provide the receiver output to an audio speaker wherein said data signals cause highly objectional noise in the output of said speaker, the improvement therewith comprising:

first means coupled to the audio detector of said receiver for providing after a first time period a first control signal during the presence of either said voice audio intelligence signals or said data audio tone intelligence signals,

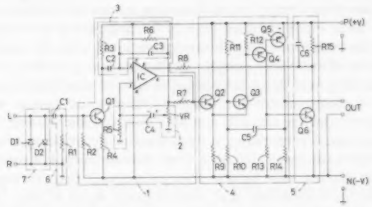
second means coupled to the audio detector of said receiver for providing after a second time period a second control signal during the presence of signals at or very near said given frequency over a time period, and

third means coupled to said speaker and responsive to said first and second control signals for coupling the output of said detector to said speaker in response to the initially received control signal at said third means being said first control signal only, and for muting said speaker in response to the initially received control signal at said third means being said second control signal only.

3,927,377
NONLINEAR FILTER FOR DETECTING ELECTROCARDIOGRAM R-WAVES AND OTHER PHYSIOLOGICAL SIGNALS

Tatsuo Iwazumi, 6548 39th Ave., NE., Seattle, Wash. 98115

Filed Mar. 1, 1974, Ser. No. 447,328
Claims priority, application Japan, Mar. 2, 1973, 48-25885
Int. Cl.² H03D *13/00;* **A61B** *5/04;* **H03B** *1/00*
U.S. Cl. 328—167 **1 Claim**



1. A nonlinear filter system for detecting a signal of a particular waveform, such as an electrocardiogram R-wave, in the presence of loud noise, said filter system comprising:

a high Q band-pass filter for detecting spectral energy of the signal of interest and producing an output indicative thereof;

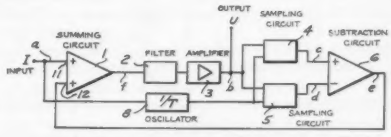
a one-shot trigger circuit connected to said band-pass filter and driven by the output thereof; and

a delay circuit means connected to said trigger circuit and said band-pass filter for reducing the Q of said band-pass filter for a short prescribed period in response to an output from said trigger circuit.

3,927,378
DEMODULATOR

Tore Torstensson Fjällbrant, Hovas, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation-in-part of Ser. No. 195,332, Nov. 3, 1971, abandoned. This application Aug. 10, 1973, Ser. No. 387,363
Claims priority, application Sweden, Nov. 23, 1970, 15810/70
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² H03D *1/06;* **H03K** *5/18*
U.S. Cl. 329—145 **6 Claims**



1. A demodulator for demodulating input signals which resulted from the variably sampled in a periodic manner of an analog signal comprising: a demodulator input being adapted

to receive the input signals; a demodulator output; a summing circuit having two inputs and an output, first connecting means for connecting said demodulator input to one of the inputs of said summing circuit; second connecting means for connecting the output of said summing circuit to said demodulator output; and sampling means, said sampling means comprising a subtraction circuit having first and second inputs and an output, said output being connected to said other input of said summing circuit, a first sampling circuit connected between said demodulator output and the first input of said subtraction circuit for uniformly sampling signals, and a second sampling circuit connected between said demodulator output and the second input of said subtraction circuit for sampling signals according to the same sampling pattern associated with the input signals.

4. A demodulator for demodulating input signals which resulted from the variably sampled in a periodic manner of an analog signal comprising a demodulator input being adapted to receive the input signals, a demodulator output, a summing circuit having two inputs and an output, first connecting means including a signal delay means for connecting said demodulator input to one of the inputs of said summing circuit, second connecting means for connecting the output of said summing circuit to said demodulator output, sampling means connected to the other input of said summing circuit, said sampling circuit means including means for feeding to the said other input sampled signals corresponding to excluded samples in the sampling patterns associated with the sampling patterns of uniformly sample signals, and low-pass filter means connecting said demodulator input to said sampling means.

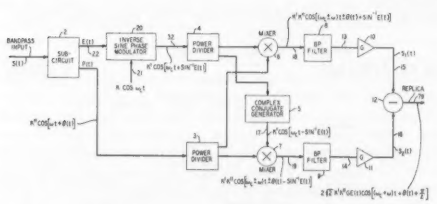
6. A demodulator for demodulating input signals which resulted from the variably sampled in a periodic manner of an analog signal comprising: a demodulator input being adapted to receive the input signals; a demodulator output, a summing circuit having two inputs and an output; first connecting means for connecting said demodulator input to one of the inputs of said summing circuit; a digital filter means connecting the output of said summing circuit to said demodulator output, and sampling circuit means including gating means connected between said demodulator output and the other input of said summing circuit, said sampling circuit means including means for feeding to the said other input sampled signals corresponding to excluded samples in the sampling patterns associated with the sampling patterns of uniformly sample signals.

3,927,379

LINEAR AMPLIFICATION USING NONLINEAR DEVICES AND INVERSE SINE PHASE MODULATION

Donald Clyde Cox, New Shrewsbury; Rollin Edward Langseth, Colts Neck; Douglas Otto John Reudink, Sea Girt, and Anthony Joseph Rustako, Jr., Colts Neck, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 8, 1975, Ser. No. 539,263
Int. Cl.² H03F *3/38*
U.S. Cl. 330—10 **7 Claims**



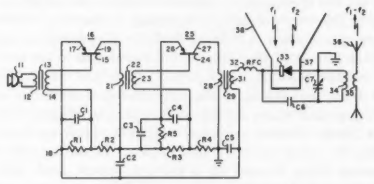
1. Apparatus for bandpass amplifying an input signal having amplitude and phase variations comprising:
means for producing from the input signal a constant amplitude component and a low-pass envelope signal;
means for processing the envelope signal to produce a constant amplitude signal whose phase variations are proportional to the inverse sine of the envelope signal;
means for generating a complex conjugate signal of the constant amplitude signal from the constant amplitude signal;
first means for mixing the complex conjugate signal with the constant amplitude component to produce a first mixed output;
second means for mixing the constant amplitude signal with the constant amplitude component to produce a second mixed output; and
means for combining the mixed outputs to produce an amplified replica of the original input signal.

3,927,380

TRANSFORMER COUPLED TRANSISTOR AMPLIFIER

John F. Zaleski, Pleasantville, N.Y., assignor to The Singer Company, Little Falls, N.J.

Filed Aug. 19, 1960, Ser. No. 50,804
Int. Cl. H03f *3/04*
U.S. Cl. 330—21 **5 Claims**



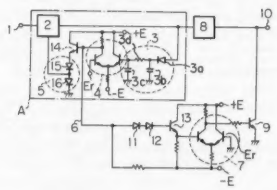
1. A two stage cascaded transistor amplifier in which the stages are transformer coupled utilizing a transformer having an impedance ratio of the order of magnitude of 1/20 characterized by the fact that the low impedance winding of the transformer is connected to the output of the first stage and the high impedence winding of the transformer is connected to the input of the second stage.

3,927,381

NON SIGNAL DETECTION TYPE AGC SYSTEM

Yashuhiro Sato, and Chikao Hirabara, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd. and Nippon Telegraph and Telephone Public Corporation, both of Tokyo, Japan

Filed Aug. 15, 1974, Ser. No. 497,623
Claims priority, application Japan, Sept. 7, 1973, 48-100259
Int. Cl.² H03G *3/30*
U.S. Cl. 330—29 **9 Claims**



1. An AGC amplifier circuit comprising:
an amplifier circuit means, having an input signal applied thereto,
a buffer circuit connected to the output of said amplifier,
a signal detector circuit connected to the output of said amplifier, for producing a DC control signal, the level of which is proportional to the output level of said amplifier,
a variable impedance circuit, connected to the output of said signal detector, the output of said variable impedance circuit being connected to said amplifier circuit to

control the gain of said amplifier circuit according to the level of said DC control signal,

a comparator circuit connected to the output of the signal detector for comparing the level of said DC control signal with a predetermined value, and

a clamping circuit connected between the output of said comparator and the output of said buffer circuit for clamping the output signal of said buffer circuit in response to the output of said comparator.

3,927,382
AMPLIFYING CIRCUIT

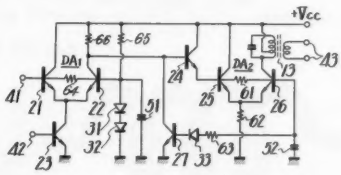
Ryuji Oki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 24, 1974, Ser. No. 509,020

Claims priority, application Japan, Oct. 2, 1973, 48-115042[U]

Int. Cl.² H03G *3/30*

U.S. Cl. 330—29 **3 Claims**



1. An amplifying circuit comprising a source of operating potential; a source of reference potential; a first amplifier stage including at least one transistor having a base electrode for receiving an input signal, a collector electrode connected to said source of operating potential and an emitter electrode; means for effecting automatic gain control of said first amplifier stage including a transistor having a base electrode adapted to receive a gain control signal and an emitter-collector path connected between said emitter of said transistor of the first amplifier stage and said source of reference potential; a second amplifier stage including an emitter-follower transistor and at least one additional transistor having a base electrode connected to the emitter of said emitter-follower transistor and collector and emitter electrodes respectively connected to said source of operating voltage and to said source of reference potential; a direct connection between said collector electrode of said one transistor of the first amplifier stage and the base electrode of said emitter-follower transistor for DC-coupling of said first and second amplifier stages; detecting means connected with said base electrode of said one additional transistor of the second amplifier stage for detecting changes in the DC level of said second amplifier stage resulting from changes in the gain of said first amplifier stage and for providing an output signal corresponding to the detected DC level change; and means for cancelling said changes in the DC level of said second amplifier stage including a transistor having a base electrode connected to said detecting means for receiving said output signal from the latter and collector and emitter electrodes respectively connected to said base electrode of the emitter-follower transistor and to said source of reference potential for varying the impedance therebetween in accordance with said output signal.

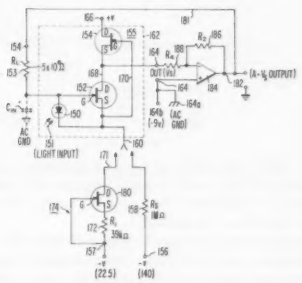
3,927,383
LOW NOISE WIDE BAND TRANSDUCER SYSTEM

Earl John Fjarlie, Dollard des Ormeaux; Thomas Doyle, Montreal, and Melvin John Teare, Pierrefonds, all of Canada, assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 246,469, April 21, 1972, abandoned. This application Aug. 20, 1974, Ser. No. 498,965

Int. Cl.² H03F *17/00*

U.S. Cl. 330—59 **8 Claims**



1. A system for amplifying wave energy signals comprising:

a field effect semiconductor device having a gate, drain, and source electrode,

a two terminal transducer for generating an electrical current in response to receipt of said wave energy, one terminal being connected to said gate electrode and the other terminal being connected to said source electrode of said device, said transducer having inherent capacitance,

a biasing impedance connected between a substantially constant voltage source and said source electrode of said device, said biasing impedance and said constant voltage source being arranged to operate said field effect semiconductor device in an unconditionally stable state at a gain approaching but less than unity, whereby, in response to said electric current, an electrical potential is developed at said gate electrode that is substantially the same as the electrical potential at the source of said device and said inherent capacitance of said transducer is significantly neutralized to a substantially negligible value.

an amplifier coupled to said source electrode of said device for generating a negative feedback voltage in response to said electric current of said transducer,

a two terminal load impedance having one terminal connected directly to said gate electrode of said device and the other terminal coupled to said negative feedback amplifier, said two terminal load impedance having an appropriately large ohmic value to maintain a large signal-to-nose ratio, whereby said negative feedback voltage effectively reduces the ohmic value of said two terminal load impedance, and

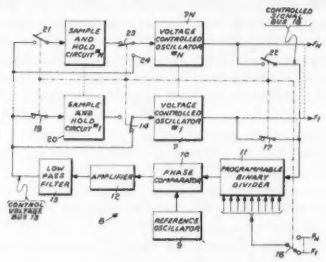
output means coupled to said negative feedback amplifier for providing a system output signal in response to the receipt of said wave energy by said transducer,

whereby said system is responsive with a substantially constant signal-to-noise ratio to said wave energy signals by neutralizing substantially said capacitance of said transducer while effectively reducing the ohmic value of said load impedance, said wave energy having a significant bandwidth.

3,927,384
FREQUENCY SYNTHESIZER

Maurice Leon Jean Jezo, Cedar Grove, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 20, 1974, Ser. No. 498,908
Int. Cl.² H03B *3/04*
U.S. Cl. 331—2 **11 Claims**



1. A phase locked loop type of frequency synthesizer to generate simultaneously N output signals each having a different one of N different frequencies, where N is an integer greater than one, comprising:

N voltage controlled oscillators each capable of generating simultaneously a different one of said N signals;

first means to produce N control signals at different times, each of said N control signals being for a different one of said N oscillators;

second means to selectively couple the output of said N oscillators at different times to the input of said firt means;

N third means each associated with a different one of said N oscillators to store that one of said N control signals controlling the associated one of said N oscillators; and

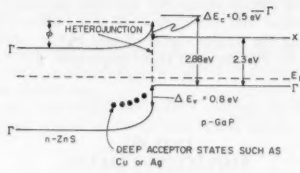
fourth means to selectively couple the output of said first means to the control input of that one of said N oscillators whose output is coupled to the input of said first means, to disconnect the output of that one of said N third means associated with said one of said N oscillators from the control input of said one of said N oscillators, to couple the output of said first means to the input of said one of said N third means, to disconnect the control input of said one of said N oscillators from said first means when the output of said first means has been connected to another of said N oscillators and its associated one of said N third means, and to connect the output of said one of said N third means to the control input of said one of said N oscillators to enable simultaneous generation of said N output signals.

3,927,385
LIGHT EMITTING DIODE

George W. Pratt, Jr., Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 277,710, Aug. 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 5,088, Jan. 22, 1970, abandoned. This application June 3, 1974, Ser. No. 475,697
Int. Cl.² H01S *3/19*; G02F *1/17*
U.S. Cl. 331—94.5 H **11 Claims**

1. A semiconductor device adapted to emit electromagnetic radiation in at least one of the infrared, visible or ultraviolet region of the spectrum, that comprises, a diode structure that includes a p-n heterojunction between single crystal materials, the material on the n-side being doped to provide deep-lying impurity states in the gap and further doped to provide electrons in the conduction band, the heterojunction being disposed along a particularly oriented plane such that the law of conservation of components of momentum perpendicular to the normal to the heterojunction plane inhibits electron injection from the n-side to the p-side and enhances hole injection from the p-side into the deep-lying impurity states on the n-side to allow transitions of electrons from the conduction band of the n-side into the deep-lying impurity states and the consequent emission of radiation.



3,927,386
METHOD AND APPARATUS FOR CIRCULARLY MAGNETIZING A HELICAL CONDUCTIVE ROD

Ivan J. Garshelis, 61 Oleander Way, Clark, N.J. 07066

Filed July 12, 1974, Ser. No. 488,220
Int. Cl.² H01F *13/00*
U.S. Cl. 335—284 **8 Claims**

1. A method for circularly magnetizing a helical conductive rod comprising the steps of:

forming the conductive rod into a helix;

enveloping the outer surface of said helical rod with an electrical insulator;

enveloping said electrical insulator with a tubular conductor;

electrically connecting one end of said tubular conductor to the corresponding end of said helical rod;

and electrically connecting the other ends of said coiled rod and said tubular conductor to a d.c. source.

3,927,387
CONTROL APPARATUS

Robert Geoffrey Birthwright, 61, Normanton Ave., Wimbledon Park, London, SW19, England

Filed Nov. 20, 1973, Ser. No. 417,599
Claims priority, application United Kingdom, July 17, 1973, 34059/73
Int. Cl.² H01H *37/36*
U.S. Cl. 338—317 **2 Claims**

1. Control apparatus comprising

a control panel,

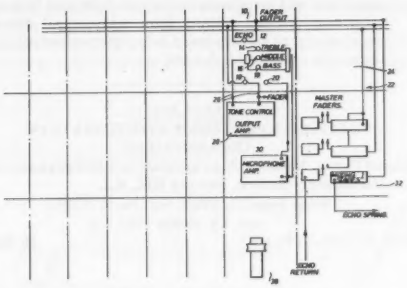
an electrical circuit board adjacent the panel,

a plurality of potentiometers each having a body from which extends an arm bearing at its free end means for operating the potentiometer and each electrically connected to a circuit on the circuit board on the solder side remote from the panel,

a plurality of manual control knobs each removably attached to one of said operating means for operating the potentiometer from which that arm extends, and

means for securing said potentiometers, panel and board

together with said arms passing through both the circuit board and the control panel including removable fastener



means between each of said knobs and said panel for holding said panel and board in firm contact.

3,927,388

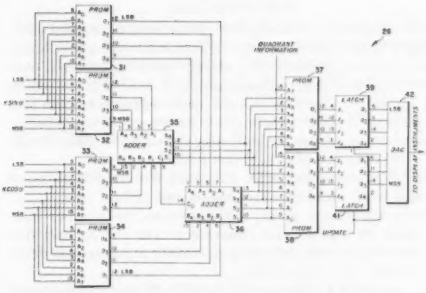
DIVERS NAVIGATION DISPLAY

Alfred M. Medrano, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 30, 1974, Ser. No. 510,347

Int. Cl.² G01S *3/80*

U.S. Cl. 340—6 R 4 Claims



1. In a beacon-homing navigation system, a signal processing circuit for converting digital sine and cosine values of a bearing angle into an analog value of said bearing angle comprising:

a first programmed read-only-memory connected to receive said digital sine values to function as an addressable look-up table and storing the logrithmic value of the address;

a second programmed read-only-memory connected to receive said digital cosine values to function as an addressable look-up table and storing the two's compliment of the logrithmic value of the address;

an adder connected to said first and second programmed read-only memories to receive the output signals thereof for summing said output signals;

a third programmed read-only memory connected to said adder to receive the summed output therefrom as addresses so as to function as a look-up table and storing the arc tangent values of the addresses;

latch means connected to said third programmed read-only memory for holding the output of said third read-only memory until a different address signal is applied to said first and second read-only memories; and

digital-to-analog converter means connected to said latch means for supplying an analog voltage corresponding to the arc tangent output of said third programmed read-only-memory.

3,927,389

DEVICE FOR DETERMINING, DURING OPERATION, THE CATEGORY OF A VEHICLE ACCORDING TO A PRE-ESTABLISHED GROUP OF CATEGORIES

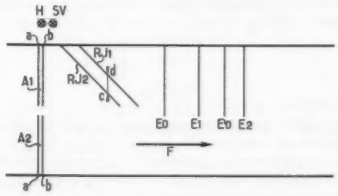
Victor Neeloff, Paris, France, assignor to Compagnie Generale d'Automatisme, Paris, France

Filed Dec. 6, 1974, Ser. No. 530,097

Claims priority, application France, Dec. 7, 1973, 73.43750

Int. Cl.² G08G *1/015*

U.S. Cl. 340—38 R 6 Claims



1. Device for determining the category of a vehicle according to a pre-established group of categories, comprising: counting detector means for detecting the passing or presence of axles and arranged traversally to the roadway, logic means connected to said counting detector means for determining the direction of movement, a reversible counter controlled by said logic means for counting the number of axles crossing said counting detector means, vehicle separating means placed near said counting detector means and having a first transducer element providing an electric signal when no vehicle is placed in front of the vehicle separating means, reset detector means for detecting the passing or presence of axles arranged traversally on the roadway and situated at a distance from said counting detector means which is less than the minimum wheel base which is required to be determined, a second transducer connected to said reset detector means and providing an electric signal when said reset detector means is actuated, a logic OR circuit receiving as one input the output of said second transducer, a delay circuit connected between said first transducer and the other input of said logic OR circuit, and at least one wheel base detector means for detecting the passing or presence of axles placed transversally on the roadway and downstream from said reset detector means in relation to the direction of movement of the vehicles, a third transducer connected to said wheel base detector means, a logic AND gate receiving as a gated input the output of said third transducer, decoder means connected to said reversible counter for enabling said logic AND gate only when a single axle of a vehicle has passed said counting detector means, said reversible counter having an input for resetting the zero connected, through the said delay circuit to the said first transducer a wheel base memory device receiving the output of said logic AND gate and having an input for resetting to zero connected to the output of the said logic OR circuit.

3,927,390

VEHICLE WARNING SYSTEMS

William Frank Hill, Stafford, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Jan. 24, 1974, Ser. No. 436,114

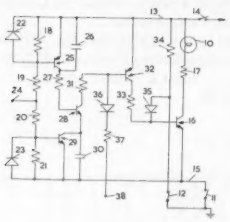
Claims priority, application United Kingdom, Feb. 2, 1973, 5306/73

Int. Cl.² G08B *19/00*

U.S. Cl. 340—60 11 Claims

1. A vehicle warning system comprising a single warning device, means responsive to engine oil pressure for energizing

said warning device only when said engine is running and the oil pressure falls below a threshold value, said means comprising a switch which opens when the engine oil pressure achieves a threshold value and which together with said warning device is connected in series with an electronic switch which is arranged to be turned on in use when the switch



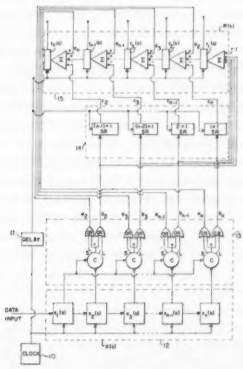
closes and when the engine is running, current to turn on the electronic switch being supplied in use from a network responsive to an engine running condition, and means responsive to engine oil level for energizing said warning device only when the engine is stationary and the engine oil level falls below a predetermined value.

3,927,391

TECHNIQUE FOR RANKING DATA OBSERVATIONS

Ben H. Cantrell, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1975, Ser. No. 561,966
Int. Cl.[2] G06F *7/02*
U.S. Cl. 340—146.2 **10 Claims**



1. An apparatus for computing the rank of each data observation in sets of data using the redundancy of rank information comprising:

control means for providing first and second control signals;

data means responsive to said first control signal for sequentially reading and storing a series of data observations;

first means coupled to said data means for providing an indication of the magnitude of each new data observation relative to previously stored data observations of said series;

second means coupled to said providing means and responsive to said second control signal for storing said magnitude indications and providing delayed outputs; and

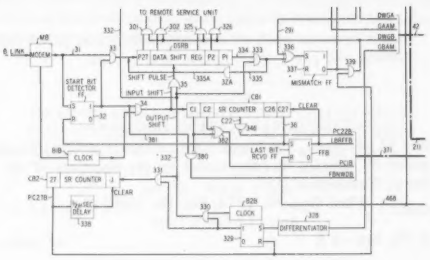
rank means coupled to said first means and to said second means and responsive to said second control signal for summing said magnitude indications from said first means and said delayed outputs from said second means to provide a rank for all stored data observations after each new data observation is read.

3,927,392

CONDITIONAL SKEW COMPENSATION ARRANGEMENT

Lionel Caron, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 17, 1974, Ser. No. 479,891
Int. Cl. H04m *3/22*
U.S. Cl. 340—146.1 BE **18 Claims**



1. In a duplicated transmission system wherein a word comprising a fixed number of bits is transmitted over a first transmission path and stored in first storage means as received over said first path, and is transmitted over a second transmission path and stored in second storage means as received over said second path, a skew compensation arrangement comprising

first counting means for indicating the number of bits of said word received over said first path;

second counting means for indicating the number of bits of said word received over said second path;

generating means jointly responsive to the number indicated by said second counting means and to said first counting means indicating a number equal to said fixed number for alternatively

1. generating a first gating signal if the number indicated by said second counting means is less than an allowable number, said allowable number being less than said fixed number, or

2. generating a second gating signal when the number indicated by said second counting means is equal to said fixed number;

first gating means responsive to said first gating signal for gating out the word stored in said first storage means; and second gating means responsive to said second gating signal for gating out the word stored in said first storage means and the word stored in said second storage means.

3,927,393

MAGNETIC RECORD MEDIUM AUTHENTICATION SYSTEM

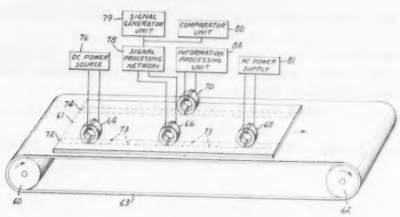
Richard E. Fayling, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 2, 1973, Ser. No. 356,602
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] G11B *5/02, 5/09*
U.S. Cl. 340—149 A **4 Claims**

1. A system for authenticating a record medium having a magnetic recording layer containing uniformly dispersed magnetizable material having magnetic anisotropy wherein the

magnetizable material at a plurality of selected locations is differently aligned from the alignment of the magnetizable material at a reference location to provide a magnetically detectable permanent fixed information pattern, which system comprises

means for applying a substantially unidirectional magnetic field to said magnetic recording layer to magnetize said



magnetizable material to different intensities depending upon the alignment thereof,

means for sensing the magnetization of said differently magnetized material to produce a signal representative of said fixed information pattern, and

means for comparing said produced signal with a predetermined signal pattern to authenticate the record medium.

3,927,394
CONTROL SYSTEM FOR COMPUTER USED FOR ON-LINE CONTROL

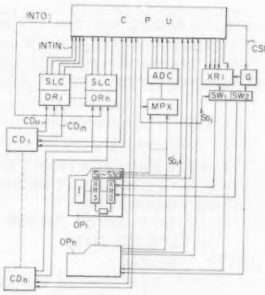
Tetuya Sugai; Hiromu Soga, both of Tokyo; Masayosi Motegi, and Hideo Kanno, both of Kawasaki, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 335,762, Feb. 26, 1973, abandoned. This application Sept. 20, 1974, Ser. No. 507,673

Claims priority, application Japan, Feb. 29, 1972, 47-20177; Feb. 29, 1972, 47-20178

Int. Cl.² G06F *3/04*

U.S. Cl. 340—172.5 **8 Claims**



1. In an information processing system having:

a. a plurality of processing devices, each having

1. an output terminal and applying thereto a signal indicative of a process interrupt condition for such processing device, and

2. an input terminal for receiving a signal indicative of a function to be performed by such processing device; and

b. a programmed computer for on-line control of said processing devices, said computer having

1. a first output terminal and applying thereto a signal indicative of a program interrupt condition for said computer,

2. second output terminals and applying separately thereto signals indicative of functions to be performed by said processing devices, and

3. first input terminals for separate receipt of signals indicative of device process interrupt conditions; the improvement comprising:

c. OR circuit means in number equal to the number of said processing devices, each said OR circuit means having first and second input terminals and an output terminal;

d. first circuit means for connecting said computer first output terminal in common to said OR circuit means first input terminals;

e. second circuit means for connecting each said processing device output terminal to a distinct one of said OR circuit means second input terminals;

f. third circuit means for connecting said OR circuit means output terminals in common to an exclusive one of said computer first input terminals.

3,927,395
CONTROL DEVICE FOR TABULATION PRINTING

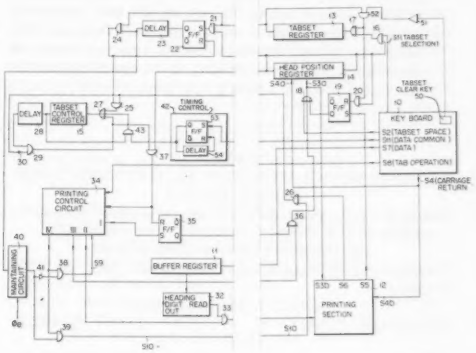
Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Higashiyamato, Japan

Filed June 21, 1973, Ser. No. 371,954

Claims priority, application Japan, June 22, 1972, 47-62672

Int. Cl.² G06C *23/06*

U.S. Cl. 340—172.5 **6 Claims**



1. A control device for tabulation printing on a printing sheet comprising:

a. an input device (**10**) including data input means (**S7**) for supplying data to be printed on said printing sheet and tabset signal input means for supplying column defining tabset position signals (**S2**) and tabset control signals (**S1, S8**);

b. first storage means (**11**) coupled to said data input means (**S7**) of said input device (**10**) and temporarily storing said printing data supplied from said data input means (**S7**);

c. a printing section (**12**) including printing means coupled to said first temporary storage means (**11**) and adapted to print the temporarily stored data in a column defined by said tabset position signals of the printing sheet to be printed, said printing section (**12**) further including means for causing a laterally relative sequential movement of the printing means and said printing sheet through a plurality of print positions associated therewith;

d. a tabset register (**13**) coupled to said tabset signal input means of said input device (**10**) and responsive to said tabset control signals (**S1**) for storing tabset position signals corresponding to at least one tabset position defining a respective printing column of the data;

e. means (**34**) coupled to said printing section (**12**) for generating printing position signals (III) corresponding to printing positions relative to said printing sheet;

f. second storage means (**14**) coupled to said printing position signal generating means (**34**) and adapted to store said generated printing position signals;

g. timing means (**S5, 19, 18**) coupled to said second storage means (**14**) and to said printing means of said printing section (**12**) and for synchronizing the operation thereof;

h. reading means (**21–25, 27**) coupled to said tabset register (**13**) and to said second storage means (**14**) for reading a lower tabset position signal, which defines a lower tabset position of a column on which said data is to be printed, from said tabset register (**13**) in response to a printing position signal (**S3***a*) stored in said second storage means (**14**);

i. a tabset control register (**15**) coupled to said reading means (**21–25, 27**) for storing said lower tabset position signal read out from said tabset register (**13**), the stored signal defining a lower tabset position of a column of said printing sheet on which said data is to be printed;

j. first control means (**42, 43, 28, 29**) coupled to said tabset control register (**15**) for storing in said tabset control register (**15**) a signal representative of a position left shifted from the storing position of said lower tabset position signal to an extent equal to the number of digits or orders of said data where the highest digit or order of said data is to be printed; and

k. a second control means (**34, 40, 41, 38, 39, 33**) coupled to said printing means of said printing section (**12**) and to said first control means (**42, 43, 28, 29**) and adapted to print the highest digit or order of said data from said first temporary storage means (**11**) in the selected column of the printing sheet corresponding to the signal representative of that position which is stored in said tabset control register (**15**).

3,927,396

STORAGE DEVICE WITH ROW FLAG ELEMENTS FOR ROW SCANNING

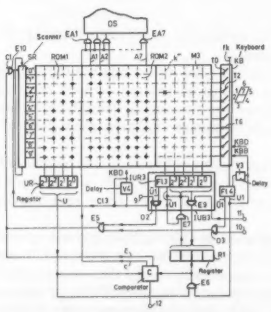
Claude Jan Principe Frederic Le Can, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 27, 1974, Ser. No. 509,782

Claims priority, application Netherlands, Oct. 3, 1973, 7313573

Int. Cl.² G11C *8/00, 15/00*

U.S. Cl. 340—173 R **13 Claims**



1. A storage device cmprising

a plurality of information storage elements organized as a matrix of conductive rows and columns;

at least one flag storage element in each of said rows of said matrix for indicating an external flagged condition;

a scanning register having a plurality of outputs each connected to a respective row conductor for scanning said flag storage elements in each of said rows, and being operatively responsive to said flagged condition in one of said flag storage elements; and

data transfer means for effecting the transfer of at least some of the stored information in said information storage elements in response to a transfer command.

3,927,397

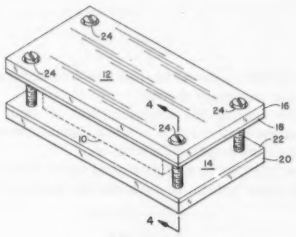
BIAS FIELD APPARATUS FOR MAGNETIC DOMAIN MEMORY DEVICE

Ling George Chow, and David S. Bartran, both of Oklahoma City, Okla., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 2, 1974, Ser. No. 466,359

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **10 Claims**



1. An improved magnetic bias field apparatus comprising:

a. a first assembly including

i. a first magnet means for establishing a magnetic pole over a first planar area, and

ii. a first magnetically permeable plate contiguous to and generally coextensive with the first planar area;

b. a second assembly including

i. a second magnet means for establishing a magnetic pole over a second planar area, and

ii. a second magnetically permeable plate contiguous to and generally coextensive with the second planar area; and

c. spacing means for holding said first and said second assemblies in generally parallel relationship with said first and said second magnetically permeable plates being between said first magnet means and said second magnet means.

3,927,398

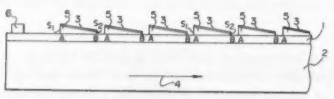
MAGNETIC BUBBLE PROPAGATION CIRCUIT

Magid Y. Dimyan, Fords, N.J., assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed Oct. 21, 1974, Ser. No. 516,484

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **4 Claims**



1. A bubble domain propagating circuit for moving bubbles along a predetermined path in a film of magnetic bubble material comprising:

an overlay of bars of magnetic material positioned over the film of magnetic bubble material, said bars defining the bubble propagation path;

means adapted to space said bars from the bubble material to maintain a uniform gradient between each of said bars

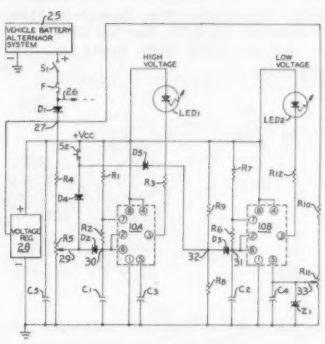
and the bubble material in the direction of said propagation path; and

means for generating a periodic magnetic field in the plane of said bubble material and parallel to said propagation path, said field being capable of magnetizing said bars.

3,927,399
BI-LEVEL CONDITION MONITOR USING REVERSE-BIASED CONTROL DIODES

Joe E. Fuzzell, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 2, 1974, Ser. No. 528,754
Int. Cl.² G08B *19/00*
U.S. Cl. 340—248 D **11 Claims**



1. A circuit for monitoring a changing condition and for indicating when said condition has changed from one side of a predetermined level to the other side thereof, said circuit comprising:

an astable oscillator means having a threshold level for initiation of oscillation and including a series-connected capacitor and resistor across a regulated supply voltage, said capacitor being chargeable through said resistor and said oscillator means being activated into oscillation in response to the charging of said capacitor to said threshold level,

an indicator means energized in response to oscillation of said oscillator means,

a current bypass path connected across said capacitor and having a diode therein,

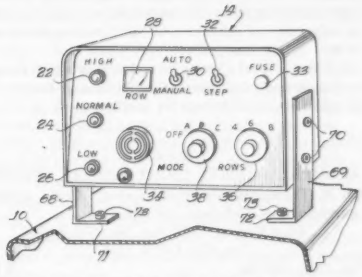
means for reverse-biasing said diode at a level less than said threshold level when said condition being monitored is on one side of said predetermined level and for reverse-biasing said diode at a level higher than said threshold level when said condition is on the other side of said predetermined level.

3,927,400
EFFICIENCY MONITORING SYSTEM FOR SEED PLANTING APPARATUS

John T. Knepler, Auburn, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Filed July 16, 1973, Ser. No. 379,711
Int. Cl.² G08B *21/00*
U.S. Cl. 340—276 **9 Claims**

1. An efficiency monitoring system for seed planting apparatus, comprising in combination: first signal producing means adapted to be connected to the seed planting apparatus to produce first signal information which corresponds to the desired number of seeds to be planted during a planting operation, second signal producing means adapted to be connected to the seed planting apparatus to produce second signal information which corresponds to the actual number of seeds being planted during said planting operation, comparison circuit means coupled to said first and second signal producing means for receiving and comparing said first signal information with said second signal information, and readout means coupled to said comparitor circuit means, said readout means includes three indicating lights, a first indicating light to give a normal indication wherein the number of seeds actually planted corresponds substantially to the number of seeds intended to be planted, a second indicating light to give a high indication when the number of seeds actually planted exceeds the number of seeds intended to be planted by a predetermined percentage, and a third indicating light to give a low indication

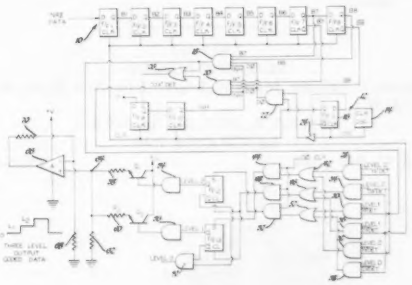


when the number of seeds acutally planted is less than the number of seeds intended to be planted by a predetermined percentage, circuit means for effecting simultaneous energization of said first and second indicating lamps to indicate the number of seeds actually being planted is more than the number of seeds desired to be planted but less than said predetermined percentage in excess thereof, said circuit means also effecting simultaneous energization of said first and third indicating lamps to indicate that the number of seeds actually planted is less than the number of seeds desired to be planted, but more than said predetermined percentage of seeds less than the number of seeds intended to be planted.

3,927,401
METHOD AND APPARATUS FOR CODING AND DECODING DIGITAL DATA

Duane E. McIntosh, Santa Ynez, Calif., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 309,355, Nov. 24, 1972, abandoned. This application Oct. 10, 1973, Ser. No. 405,070
Int. Cl.² H04L *3/00*
U.S. Cl. 340—347 DD **17 Claims**



1. A method of encoding binary data comprising the steps of:

1. detecting the bit configuration of adjacent bits in data;

2. upon detection of a first of the four possible two bit configurations producing a level change in an output signal from the existing level to a first level unless the existing level of said output signal is said first level in

which event producing a level change from said first level to a third level;

3. upon detection of a second of said four possible two bit configurations, the second bit of which is the complement of the second bit of said first of said four possible two bit configurations, producing a level change in said output signal from the existing level to a second level unless the existing level of said output signal is said second level in which event producing a level change from said second level to said third level;

4. upon detection of either of the other two of said four possible two bit configurations maintaining the level of said output signal at the level existing prior to detection of either of said other two of said four two bit configurations;

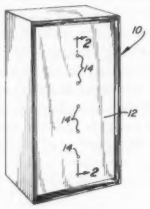
5. inhibiting a level change in said output signal for one bit cell time upon detection of either of said first or second of said four possible two bit configuration.

3,927,402

AUDIO RESPONSIVE LIGHT DISPLAY SYSTEM

Marion E. Thompson, Colorado Springs, Colo., assignor to Maytronics, Inc., Colorado Springs, Colo.

Filed Dec. 9, 1974, Ser. No. 531,045
Int. Cl.² G08B 5/36
U.S. Cl. 340—366 B **8 Claims**



1. An audio responsive light display system comprising in combination;

a speaker responsive to an audio signal for producing a feedback impulse;

a displayed light emitting diode;

an external low voltage dc source for lighting said light emitting diode and connected thereto; and

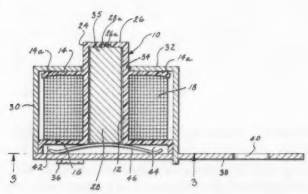
means for modulating the current flow from said dc source to said light emitting diode in response to said feedback impulse.

3,927,403

ELECTRIC BUZZER

Spencer C. Schantz, 16608 W. Rogers Drive, New Berlin, Wis. 53151

Filed Feb. 6, 1975, Ser. No. 547,411
Int. Cl.² G08B 3/10
U.S. Cl. 340—396 **9 Claims**



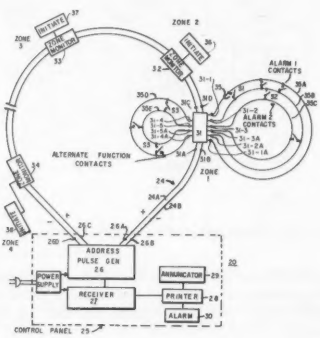
1. An electric buzzer comprising a bobbin of non-magnetic material having a central sleeve portion with a bore, an electric coil wound on said bobbin around said sleeve portion, one end of said sleeve portion projecting beyond an end of the coil and being closed to close said end of the bore, and the other end being open, a magnetic core slideably mounted in the bore of said sleeve portion and having an end projecting into the projecting portion of the sleeve, a bracket of magnetic material attached to the end of the bobbin opposite the end having the projecting sleeve portion and closing the open end of the sleeve bore, and spring means normally urging said core toward the closed end of the sleeve bore.

3,927,404

TIME DIVISION MULTIPLE ACCESS COMMUNICATION SYSTEM FOR STATUS MONITORING

Glenn F. Cooper, West Springfield, Mass., assignor to Standard Electric Time Corporation, Springfield, Mass.

Filed Oct. 18, 1973, Ser. No. 407,660
Int. Cl.² G08B 19/00; H04Q 3/00
U.S. Cl. 340—413 **57 Claims**



1. In a communication system for reporting information from a plurality of remote locations to a control location over a common communication channel, monitoring means at each of said remote locations including signal generating means operable to provide an information signal representing the condition of at least one variable monitored by said monitoring means for transmission over said communication channel to said control location, the signal generating means of different monitoring means being operable to provide an information signal during a different preassigned time slot, and master control means at said control location, including means for generating a synchronizing signal for defining the time slots for said monitoring means, and at least one slave control means connected in a local loop with at least certain ones of said monitoring means, said slave control means being connected to said common communication channel to receive said synchronizing signal and to responsively provide a further synchronizing signal for transmission over said local loop for controlling the operation of said certain monitoring means.

3,927,405

SYSTEM FOR PROCESSING THE SIGNAL RECEIVED BY A SIDEWAYS LOOKING AIRBORNE RADAR SYSTEM

Henri Poinsard, and Jean Lemoing, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 17, 1973, Ser. No. 361,443
Claims priority, application France, May 19, 1972, 72.18033
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² G01S 9/02
U.S. Cl. 343—5 CM **7 Claims**

7. A system for processing the signals received by a sideways looking airborne pulse radar system, used in combina-

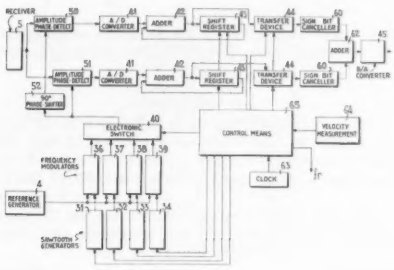
tion with a device for measuring the velocity of the aircraft comprising:

first generating means for providing a reference signal;

second generating means for providing a plurality of sawtooth signals, each sawtooth signal having a repetition period and a slope depending on both the velocity of the aircraft and the distance of a determined target region;

distance gating means for successively selecting portions of said sawtooth signals at determined instants of each repetition period of the radar pulses;

modulating means for modulating said reference signal with the output signal of said distance gating means thereby providing a sawtooth frequency modulated signal;



comparing means for comparing said received signals with said sawtooth frequency modulated signal, providing output signals in response to said comparison;

range-gated integrating filtering means for integrating each output signal of the comparing means during a period equal to the repetition period of the corresponding sawtooth signal used for providing said output signal; and

control means fed by said velocity measuring device and coupled to said second generating means for controlling the periods and slopes of said sawtooth signals and to said integrating means for controlling their integration time.

3,927,406

METHOD AND APPARATUS FOR OFF-BORESIGHT ANGLE CORRECTION FOR MONOPULSE RADARS WITH SLOW AGC NORMALIZATION

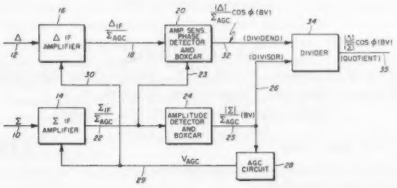
Joseph Albert Bruder, Snyder, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Mar. 30, 1973, Ser. No. 346,487

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G01S 9/22

U.S. Cl. 343—16 M **10 Claims**



1. A method for off-boresight angle correction in a 2-horn monopulse radar employing a slow AGC normalization including the steps of:

receiving a first signal representing the vector sum of the signals in the two horns;

receiving a second signal representing the vector difference of the signals in the two horns;

amplifying said first and second signals;

detecting and boxcarring said amplified first signal;

using said boxcarred first signal in an AGC circuit to control the gain in the amplifying of said first and second signals;

detecting and boxcarring said amplified second signal responsive to the phase of said amplified first signal; and

dividing said boxcarred second signal by said boxcarred first signal whereby the off-boresight angle is determined independent of the influence of said AGC circuit.

2. A method for off-boresight angle correction in a 4-horn monopulse radar employing a slow AGC normalization including the steps of:

receiving a first signal representing the vector sum of the signals in the four horns;

receiving a second signal representing the vector sum of the signals in the two horns on the left side minus the vector sum of the signals in two horns on the right side;

receiving a third signal representing the vector sum of the signals in the top two horns minus the vector sum of the signals in the bottom two horns;

amplifying said first, second and third signals;

detecting and boxcarring said amplified first signal;

using said boxcarred first signal in an AGC circuit to control the gain in amplifying said first, second and third signals;

detecting and boxcarring said amplified second and third signals responsive to the phase of said amplified first signal;

dividing said boxcarred second signal by said boxcarred first signal; and

dividing said boxcarred third signal by said boxcarred first signal, whereby the azimuth and elevation off-boresight angles are determined independent of the influence of said AGC circuit.

3,927,407

REFLECTOR ANTENNA WITH FOCUSING SPHERICAL LENS

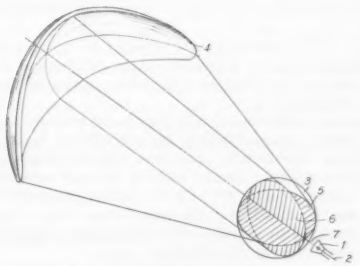
Gerhard Beck, and Siegfried Zeininger, both of Flensburg, Germany, assignors to Eltro GmbH Gesellschaft fur Strahlungstechnik, Heidelberg, Germany

Filed Sept. 6, 1974, Ser. No. 503,912

Claims priority, application Germany, Sept. 7, 1973, 2345222

Int. Cl.[2] H01Q 19/06

U.S. Cl. 343—754 **4 Claims**



1. In a reflector antenna providing for asymmetrical beam focusing or collimating for shortwave radar transmitting and receiving operation, including a multiple curved reflector rotating at a constant velocity; and a stationary primary radiation source, the improvement comprising: said reflector in-

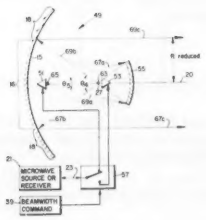
cluding an elliptical reflector aperture, a spherical lens of relatively wide frequency band width being interposed between said reflector and said primary energy source, said spherical lens constituting a rotary coupling for transfer of radiation from said primary energy source and concurrently forming a condenser for illuminating said elliptical reflector aperture, said spherical lens rotating in unison with said reflector, said beam extending through said spherical lens in circularly bound transverse planes intersecting the rotational axis thereof whereby said reflector antenna is adapted to generate an asymmetrical tracking pattern with elliptical cross-section relative to the reflector axis of said reflector antenna evincing a relatively large focusing in the azimuth plane and a relatively small focusing in the elevational plane predicated on the application of said antenna.

3,927,408

SINGLE FREQUENCY, TWO FEED DISH ANTENNA HAVING SWITCHABLE BEAMWIDTH

Richard F. Schmidt, Seabrook, Md., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Oct. 4, 1974, Ser. No. 512,825
Int. Cl.² H01Q *19/12*
U.S. Cl. 343—779 **2 Claims**



2. An electronically selectable beamwidth antenna comprising:

a concave paraboloid main reflector having an axis and a focal point, and where said main reflector has a central circular region and an outer annular region bordering the central region;

a concave ellipsoid subreflector coaxial with and facing the concave main reflector, the subreflector having a first focus substantially coincident with the main reflector focal point for directly exciting the main reflector and a second focus on the axis for exciting the main reflector via the subreflector, the subreflector being of such size that only the central portion of the main reflector can be viewed via the subreflector;

first feed means, located at the first focus of the subreflector for directly exciting the main reflector at a predetermined frequency;

second feed means, located at the second focus of the subreflector for exciting, via the subreflector, only the central portion of the main reflector at said predetermined frequency; and

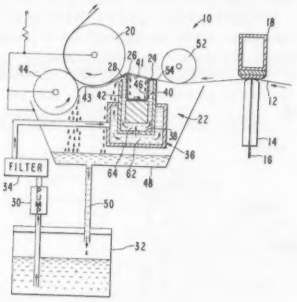
switch means for operatively selecting the first or second feed means.

3,927,409

MULTISTAGE THIN FILM TONING SYSTEM FOR DEVELOPING CHARGED IMAGES

Heino Kase, Walnut Creek; Edward W. Marshall, Saratoga, and Survrat Kirtikar, Stanford, all of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed May 1, 1972, Ser. No. 249,258
Int. Cl.² B05B *5/02*
U.S. Cl. 346—74 ES **7 Claims**



1. A recording device for forming a charge image on the charge retentive surface of a recording medium and toning the charge image with toner particles dispersed in a carrier liquid, comprising the combination:

means for moving the recording medium relative to the recording device along a path of motion;

means for forming a charge image on the charge retentive surface of the recording medium;

a plurality of liquid toner applying means spaced from one another along the path of motion of said recording medium, each of said toner applying means arranged to apply a thin film of toner to the charge image on the recording medium;

a. liquid toner squeegee means positioned between each of the spaced toner applying means to remove the thin film of toner from the charge retentive surface before the toner becomes substantially depleted of toner particles; and

final liquid toner squeegee means positioned subsequent to the last toner applying means along the path of motion to remove the thin film of toner applied by the last toner applying means.

3,927,410

INK JET NOZZLE

Walter T. Pimbley, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1974, Ser. No. 465,632
Int. Cl.² G01D *15/18*
U.S. Cl. 346—140 **6 Claims**

1. In an ink jet printer apparatus,

a support member,

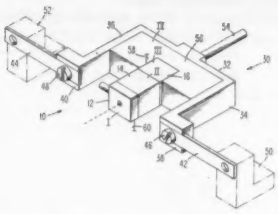
a substantially flat ink jet nozzle structure disposed for connection to a source of ink,

a reaction mass,

damping means resiliently connecting said reaction mass to said support member, and

transducer means operating in a thickness mode connecting

said nozzle structure to said reaction mass for producing resonant periodic bodily vibration of said nozzle and



reaction mass independently of said support member to produce periodic drops of ink from said nozzle.

3,927,411

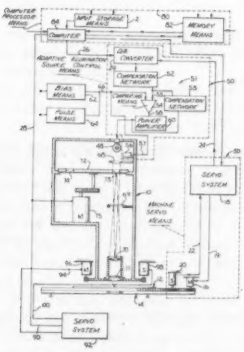
ADAPTIVE ILLUMINATION CONTROL DEVICE

Barry T. Lee, 22715 Clarendon St., Woodland Hills, Calif. 91364; Gunther W. Wimmer, 19633 Goodvale Road, Saugus, Calif. 91350, and Gilbert P. Hyatt, 11101 Amigo Ave., Northridge, Calif. 91324

Division of Ser. No. 152,105, June 11, 1971, Pat. No. 3,738,242. This application Jan. 22, 1973, Ser. No. 325,792

Int. Cl.[2] G03B *41/00*

U.S. Cl. 354—4 **21 Claims**



1. An illumination control system for selectively exposing an illumination sensitive medium to provide a desired exposure pattern, said system comprising:

illumination means for providing controlled illumination in response to an illumination control signal;

an illumination sensitive medium for providing illumination exposures in response to the controlled illumination;

translation means for providing translation between said illumination means and said illumination sensitive medium in response to a translation control signal;

translation control means for generating the translation control signal;

illumination control means for generating the illumination control signal in response to an illumination feedback signal and a translation feedback signal;

illumination feedback means for generating the illumination feedback signal in response to the controlled illumination; and

translation feedback means for generating the translation feedback signal in response to the translation between said illumination means and said illumination sensitive medium.

3,927,412

ADAPTER FOR USE WITH A PACKAGED FLASHLAMP ARRAY

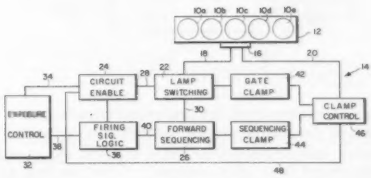
Seymour Ellin, Chestnut Hill, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 26, 1973, Ser. No. 383,465

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G03B *15/03, 15/02*

U.S. Cl. 354—143 **36 Claims**



1. An adapter for mountably receiving a packaged linear flashlamp array having a plurality of discrete igniting signal input contact surfaces, said adapter being operative in association with photographic apparatus of a variety including a housing, a taking lens mounted thereon, mounting means for supporting non-linear flash means, said mounting means including igniting output terminals connectable in igniting relationship with said flash means, and a shutter mechanism having a synchronization switch actuable in response to shutter actuation to effect an ignition of said flash means from said output terminals, said adapter comprising:

means mountable upon said housing for receiving and supporting said packaged linear flash array and including contact means discretely connectable in circuit completing relationship with select ones of said contact surfaces;

a flash firing circuit coupled in operative relationship with said receiving and supporting means, said circuit having an actuating input and further having an activating input for selective energization from a power supply and being operative in the presence of said selective energization to ignite said flashlamps within said array through said contact means in response to receipt at said actuating input of a firing signal of predetermined voltage characteristic;

means for establishing said electrical power supply when connected to a battery source; and

control means coupled with said activating input, said actuating input, said power supply means and said synchronization switch, for effecting the said energization of said firing circuit and for deriving said firing signal at said actuating input in response to said actuation of said synchronization switch.

3,927,413

MOTOR-DRIVEN DEVICE FOR USE IN A LONG FILM STRIP MAGAZINE

Shuji Kimura, and Kouichi Takahata, both of Tokyo, Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed May 23, 1974, Ser. No. 472,676

Claims priority, application Japan, May 25, 1973, 48-57684

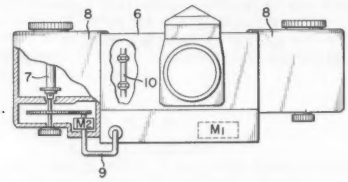
Int. Cl.[2] G03B *1/00, 19/04*

U.S. Cl. 354—173 **4 Claims**

1. In an electrically-operated photographic camera adapted for use with a long film strip magazine, the combination comprising:

a. a camera body having film transfer means and a first prime mover for operation of said film transfer means and for simultaneously charging a shutter;

b. a long strip photographic film magazine adapted to be mounted on said camera body and having therein film winding means and a second prime mover for operating said film winding means;



c. electric power supply for said prime movers; and

d. electric control means for stopping said second prime mover and for stopping said first prime mover a predetermined time after stoppage of said second prime mover, whereby a slight degree of slack or relaxation is imparted to the photographic film extending between said film transfer means and said film winding means.

3,927,414

AUTOMATIC CAMERA SETTING APPARATUS

Itsuki Moriyama, and Shigeo Enomoto, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

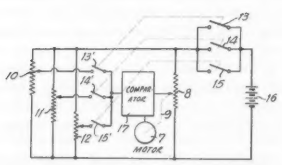
Filed Nov. 29, 1973, Ser. No. 420,148

Claims priority, application Japan, Nov. 30, 1972, 47-120008

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G03B *3/00, 13/02, 27/52*

U.S. Cl. 354—195 **10 Claims**



1. In a photographic apparatus for photographing an object automatically with at least one predetermined camera setting when a camera has its optical axis displaced from a location out of line with to a location in alignment with the object, a pair of means consisting of a reference means and a movable means movable with respect to said reference means, said movable means carrying the camera for moving the camera with said movable means to displace the optical axis of the camera from a location out of line with an object to be photographed to a location where said optical axis is in line with the object to be photographed, manually adjustable detecting means, connected in part to one and in part to the other said pair of means, for automatically providing an operating signal when the camera is displaced to a position where its optical axis is aligned with the object, and camera control means for storing said predetermined setting, said control means being operatively connected with the camera and said detecting means for responding to said signal to automatically set the camera with said predetermined setting.

3,927,415

ELECTROMAGNETICALLY REGULATED EXPOSURE CONTROL SYSTEM

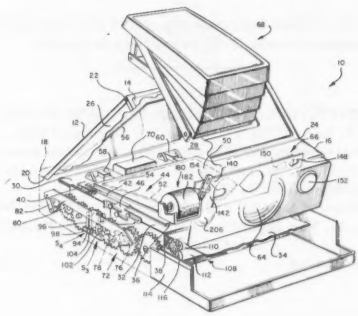
Christian C. Petersen, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 11, 1973, Ser. No. 350,025

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G03B *7/08, 9/02*

U.S. Cl. 354—230 **31 Claims**



2. A method of operating a photographic exposure control system to define a controlled exposure value, said system including means responsive to a given level of electrical energization for effecting the displacement of said exposure mechanism from one of its said positions into the other of its said positions, said method including the steps of energizing said displacement effecting means at said given level of electrical energization to effect the displacement of said exposure mechanism means from its said one position into its said other position and displacing said exposure mechanism means from its said other position into its said one position by urging said exposure mechanism means towards its said one position while substantially continuously energizing said displacement effecting means at a level of electrical energization less than said given level of electrical energization so as to retard but not preclude the displacement of said exposure mechanism means from its said other position into its said one position.

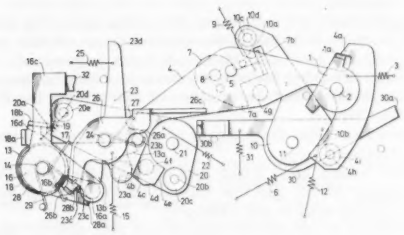
14. In an exposure control system of a variety wherein a solenoid including an excitation winding and a plunger is employed to be energized at one current level to cause said plunger to be retracted toward a position providing a high flux linkage condition within the magnetic circuit of said solenoid, said plunger being driveably associated with an exposure mechanism and spring means such that said mechanism is moved to block a scene light entrance opening when said plunger is retracted and is moved with said plunger by a bias of said spring means to define a variation of aperture values over said opening upon de-energization of said winding, the improvement comprising:

control means for energizing said winding at another current level selected below said one current level substantially throughout said movement under said bias for selectively regulating the rate of said plunger movement under said spring means bias.

3,927,416
SHUTTER FOR CAMERAS

Nobuyoshi Inoue, Kawagoe, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed May 3, 1974, Ser. No. 466,893
Claims priority, application Japan, May 9, 1973, 48-51436
Int. Cl.² G03B 9/08, 17/18
U.S. Cl. 354—235 1 Claim

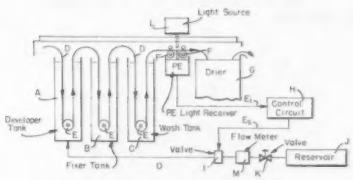


1. An electronic shutter for cameras comprising:
a control lever adapted to be relieved of its locked state by a shutter release operation,
a front blade release lever engageable with said control lever and rotated by the motion of said control lever,
a front blade driving lever engageable with said front blade release lever and released by the motion of said front blade release lever,
a holding lever engageable with said control lever and rotated by the motion of said control lever;
a magnet lever engageable with said holding lever and rotatable by following the rotation of said holding lever,
an electromagnet positioned adjacent to said magnet lever and capable of attracting said magnet lever thereto,
a rear blade release lever engageable with said magnet lever and rotated by said magnet lever in the final stage of motion of this magnet lever,
a rear blade driving lever engageable with said rear blade release lever and released by the motion of said rear blade release lever,
a signaling lever engageable with said control lever and pivotable by the motion of said control lever, to indicate that the exposure time has been mechanically controlled,
a lever engageable with said signaling lever and with said magnet lever, to lock said signaling lever in its pivoted position,
a mechanical exposure control lever urged to engage with said signaling lever and capable of entering in the path of motion of said magnet lever, and
a release lever engageable with said front blade driving lever and with said mechanical exposure control lever,
said shutter being arranged so that only when said magnet lever is not attracted to said electromagnet at the time of a shutter release, said magnet lever is locked by said mechanical exposure control lever and at the same time said signaling lever is locked by said signal lever locking lever in its pivoted position, whereby the state of locking of said magnet lever and said signaling lever is released when said mechanical exposure control lever is moved by said release lever.

3,927,417
AUTOMATIC FILM PROCESSOR REPLENISHMENT SYSTEM

Minoru Kinoshita, and Osami Taniuchi, both of Kyoto, Japan, assignors to LogEtronics Inc., Springfield, Va.

Filed Nov. 2, 1973, Ser. No. 412,516
Claims priority, application Japan, Mar. 7, 1973, 48-26197
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² G03D 13/00
U.S. Cl. 354—298 7 Claims

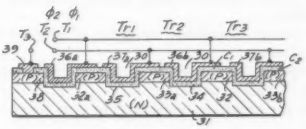


1. A control circuit for controlling chemical replenishment in an automatic film processor, comprising sensor means responsive to the image density in a sheet of film being processed for producing a sensing signal proportional to said density, means coupling said sensing signal to the input of an integrator means, said integrator means being operative to integrate said signal during a predetermined time interval, a reference source having a polarity opposite that of said sensing signal, means responsive to elapse of said predetermined time interval for coupling said source to the input of said integrator means to cause the sensing signal already integrated by said integrator means and any further sensing signal subsequently applied to the input of said integrator means to be differentially integrated and the output of said integrator means reduced in value toward a predetermined reference level, means responsive to elapse of said predetermined time interval for initiating flow of said replenishment chemical, and means responsive to reduction of the output of said integrator means to said reference level for terminating flow of said replenishment chemical.

3,927,418
CHARGE TRANSFER DEVICE

Tetsuo Ando, Ebina, and Yoshimi Hirata, Hatano, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 312,332, Dec. 5, 1972, Pat. No. 3,848,328.
This application Sept. 5, 1974, Ser. No. 503,372
Claims priority, application Japan, Dec. 11, 1971, 46-100410
Int. Cl.² H01L 27/10, 29/78
U.S. Cl. 357—24 7 Claims



1. A charge transfer device comprising: a semiconductor substrate of a first conductivity having an uneven surface formed of square cornered notches; at least two semiconductor switches each having a source, drain, channel and gate region; said drain and source regions being positioned higher than said channel region and being of opposite conductivity such that P-N junctions are formed above the surface of said substrate between said drain and source regions; an insulating layer covering said source, drain and channel regions of each

semiconductor switch and forming a capacitor in parallel with said gate and drain regions.

3,927,419

CARTRIDGE TAPE PLAYER

Minoru Tozawa, Kyoto, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

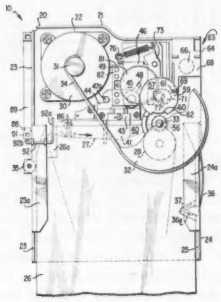
Filed Apr. 12, 1973, Ser. No. 350,589

Claims priority, application Japan, Apr. 20, 1972, 47-39839

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G11B *23/18, 21/08, 23/04*

U.S. Cl. 360—94 **1 Claim**



1. A cartridge tape player for reproducing a first cartridge having four programs with two tracks per program and for reproducing a second cartridge having two programs with four tracks per program comprising:

a first magnetic head,

a first pre-amplifier connected to said first magnetic head, first volume control means connected to said first pre-amplifier,

a first power amplifier connected to said first volume control means,

a first speaker connected to said first power amplifier,

a second magnetic head,

a second pre-amplifier connected to said second magnetic head,

second volume control means connected to said second pre-amplifier,

a second power amplifier connected to said second volume control means,

a second speaker connected to said second power amplifier, a third magnetic head,

a third pre-amplifier connected to said third magnetic head, third volume control means connected to said third pre-amplifier,

a third power amplifier connected to said third volume control means,

a third speaker connected to said third power amplifier,

a fourth magnetic head,

a fourth pre-amplifier connected to said fourth magnetic head,

fourth volume control means connected to said fourth pre-amplifier,

a fourth power amplifier connected to said fourth volume control means,

a fourth speaker connected to said fourth power amplifier, a first display lamp to indicate when a first program of the first or second cartridge is being reproduced,

a second display lamp to indicate when a second program of the first or second cartridge is being reproduced,

a third display lamp to indicate when a third program of the first cartridge is being reproduced.

a fourth display lamp to indicate when a fourth program of the first cartridge is being reproduced,

first selection means for selecting reproduction of the first program of the first or second cartridge,

second selection means for selecting reproduction of the second program of the first or second cartridge,

third selection means for selecting reproduction of the third program of the first cartridge,

fourth selection means for selecting reproduction of the fourth program of the first cartridge,

said first, second, third and fourtth magnetic heads being arranged in a four head assembly wherein each head is spaced from adjacent heads by substantially a two track distance,

means responsive to the detection of the end of the each program of the first or second cartridge to displace said magnetic head assembly in a direction perpendicular to the track length for reproduction of successive programs, means to detect the presence of and identify the first cartridge,

means to detect the presence of and identify the second cartridge,

first, second, third, fourth and fifth switches ganged together so that said first, second, third, fourth and fifth switches operate simultaneously,

means to simultaneously position said first, second, third, fourth and fifth switches in a first position in response to detection of the identification of the second cartridge,

means to simultaneously position said first, second, third, fourth and fifth switches in a second position in response to the detection of and identification of the first cartridge, said first switch when in its first position functioning to prohibit illumination of said third and fourth display lamps,

said first switch when in its second position functioning to permit selective lighting of said third and fourth display lamps,

said second switch when in its first position functioning to prohibit selection for reproduction of the third program of the second cartridge,

said second switch when in its second position functioning to permit selection for reproduction of the third program of the first cartridge,

said third switch when in its first position functioning to prohibit selection for reproduction of the fourth program of the second cartridge,

said third switch when in its second position functioning to permit selection for reproduction of the fourth program of the first cartridge,

said fourth switch when in its first position functioning to permit the second speaker to reproduce the signal picked up by the second magnetic head,

said fourth switch when in its second position functioning to disconnect the second magnetic head from said second speaker and functioning to connect the first magnetic head to said second speaker,

said fifth switch when in its first position functioning to permit the fourth speaker to reproduce the signal picked up by said fourth magnetic head,

said fifth switch when in its second position functioning to disconnect the fourth magnetic head from said fourth speaker and functioning to connect the third magnetic head to said fourth speaker whereby,

the first program of the first cartridge is reproduced from the first and fifth tracks by the first and third heads which are coupled to the first and second speakers, and third and fourth speakers respectively while the first display lamp is illuminated,

the second program of the first cartridge is reproduced from the second and sixth tracks by the first and third heads which are coupled to the first and second speakers, and third and fourth speakers respectively while the second display lamp is illuminated,

the third program of the first cartridge is reproduced from

the third and seventh tracks by the first and third heads which are coupled to the first and second speakers, and third and fourth speakers respectively while the third lamp is illuminated,

the fourth program of the first cartridge is reproduced from the fourth and eighth tracks by the first and third heads which are coupled to the first and second speakers, and third and fourth speakers respectively while the fourth display lamp is illuminated,

the first program of the second cartridge is reproduced from the first, third, fifth and seventh tracks by the first, second, third and fourth heads respectively which are coupled to the first, second, third and fourth speakers respectively while the first display lamp is illuminated, and

the second program of the second cartridge is reproduced from the second, fourth, sixth and eighth tracks by the first, second, third, and fourth heads respectively which are coupled to the first, second, third and fourth speakers respectively while the second display lamp is illuminated.

3,927,420

FREQUENCY DEPENDENT COMPENSATING CIRCUIT FOR MAGNETIC RECORDING SIGNALS

Kenji Hayashi, Kamakura; Yasufumi Yumde, and Kotaro Kawamura, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 2, 1973, Ser. No. 412,153

Claims priority, application Japan, Nov. 6, 1972, 47-110330

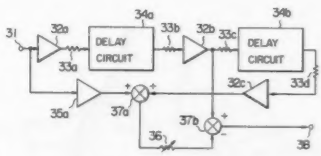
Int. Cl.² G11B *5/45;* **H03F** *3/45*

U.S. Cl. 360—65 **3 Claims**

1. A magnetic recording apparatus for audio signals including means for correcting for the reduction in amplitude of a signal with the increasing of the frequency thereof on recording the signal on a recording medium, said means for correcting comprising:

a delay circuit having input and output terminals and adapted to delay a signal passed therethrough by a delay time of τ,

means for providing said delay circuit with impedance matching at only one of said input and output terminals, means for applying an input signal to be recorded to said input terminal of said delay circuit, thereby producing a first delay signal delayed by τ from said input signal at said output terminal thereof,



means for applying said input signal to be recorded to the one impedance-matched terminal to have said input signal reflected at the other terminal, thereby providing at said one terminal a second delay signal delayed by 2τ from said input signal,

means for adding said input signal to said second delay signal, and

means for producing a difference between said first delay signal and the addition of said input signal and said second delay signal.

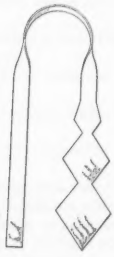
DESIGNS

DECEMBER 16, 1975

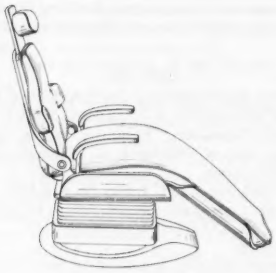
238,016
SKI BOOT
Alden B. Hanson and Chris A. Hanson, Boulder, Colo., assignors to Hanson Industries Inc., Boulder, Colo.
Filed Mar. 14, 1974, Ser. No. 451,235
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—276

238,017
SPORT SHOE
William J. Cohen, Boston, Mass., assignor to CITC Industries, New York, N.Y.
Filed Oct. 24, 1972, Ser. No. 300,130
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

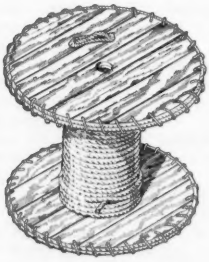
238,018
NECKTIE
Don A. Mackie, 47 Cottleville, St. Peters, Mo. 63376
Filed Feb. 21, 1973, Ser. No. 334,659
Term of patent 14 years
Int. Cl. D2—*05*
U.S. Cl. D2—351



238,019
TREATMENT CHAIR
Dennis Frank Leffler, 2313 Vineyard Lane, Charlotte, N.C. 28201, and Danny Michael Truette, Rte. 1, Box 341-F, Harrisburg, N.C. 28075
Filed June 11, 1973, Ser. No. 368,859
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—22

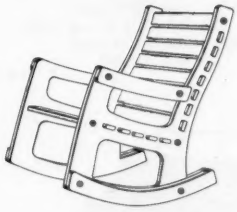


238,020
COCKTAIL TABLE
Donald B. Gold, San Rafael, Calif., assignor to K.I.S.S. Industries, Inc., San Rafael, Calif.
Filed Sept. 3, 1974, Ser. No. 502,602
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—27

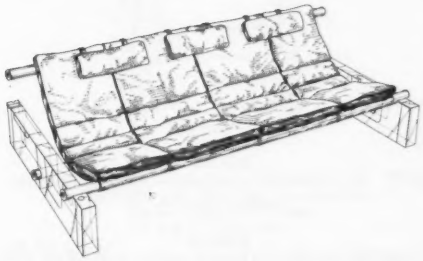


238,021
FOLDING CHAIR
Lawrence D. Minsker, 102 Pleasant View Drive, Jamestown, N.Y. 14701
Filed Aug. 19, 1974, Ser. No. 498,314
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—41

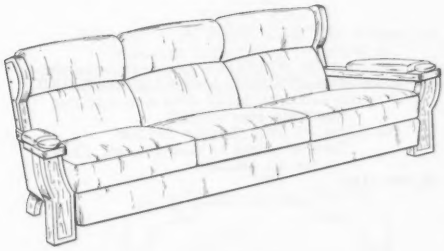
238,022
ROCKING CHAIR
C. Lee Payne, Jr., and Vincent J. Gambello, Hastings-on-Hudson, N.Y., assignors to Sea Pines Company, Hilton Head Island, S.C.
Filed Mar. 4, 1974, Ser. No. 448,066
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49



238,023
DIVAN
Vittorio Mazzucconi, Milan, Italy, assignor to ICF de Padova S.r.l., Vimodrone, Milan, Italy
Filed Feb. 26, 1973, Ser. No. 336,999
Claims priority, application Italy Aug. 26, 1972
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—62

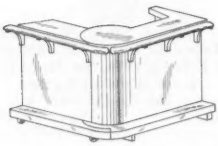


238,024
SEAT
Stanley P. Nash, Rte. 1, Riverhill Drive, Johnson Creek, Wis. 53038
Filed Feb. 11, 1974, Ser. No. 441,164
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

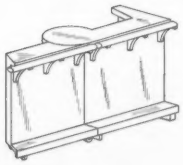


238,025
CONTAINER FOR PAPER ROLLS
Roger Persson, Mariestad, Sweden, assignor to Kooperativa Forbundet Fack, Stockholm, Sweden
Filed Nov. 14, 1974, Ser. No. 523,820
Claims priority, application Sweden May 15, 1974
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—96

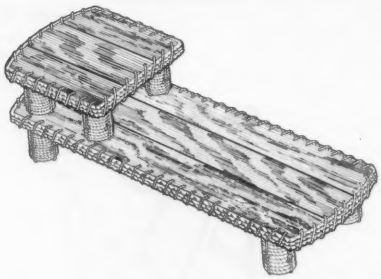
238,026
COMBINED ROOM DIVIDER AND CLOSABLE BAR
Maurice L. Lorge, 12167 69th Ave., Seminole, Fla. 33540
Filed June 29, 1973, Ser. No. 374,938
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—144



238,027
COMBINED ROOM DIVIDER AND CLOSABLE BAR
Maurice L. Lorge, 12167 69th Ave., Seminole, Fla. 33540
Filed Aug. 24, 1973, Ser. No. 391,218
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—144

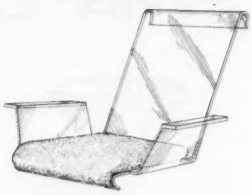


238,028
END TABLE
Donald B. Gold, San Rafael, Calif., assignor to K.I.S.S. Industries, Inc., San Rafael, Calif.
Filed Sept. 3, 1974, Ser. No. 502,624
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—179

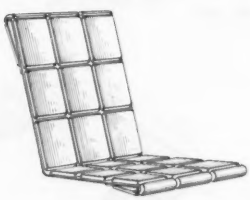


238,029
CARPET SAMPLE DISPLAY STAND
Fred Howard, New York, N.Y., assignor to Howard Displays, Inc., New York, N.Y.
Filed Feb. 5, 1973, Ser. No. 329,552
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186

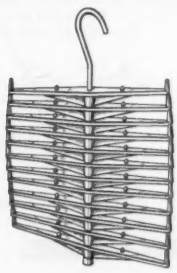
238,030
STACKABLE CHAIR BODY
Gerry D. Welton, 910 E. Tripp, Peoria, Ill. 61603
Filed May 1, 1973, Ser. No. 356,107
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197



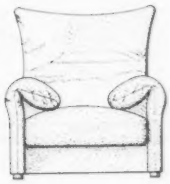
238,031
SLING CHAIR BODY
Gerry D. Welton, 910 E. Tripp, Peoria, Ill. 61603
Filed Oct. 12, 1973, Ser. No. 405,930
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197



238,032
TIE RACK
Thomas W. Duncan, 800 Tulip Lane, Connersville, Ind. 47331
Filed Jan. 6, 1975, Ser. No. 538,608
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—251

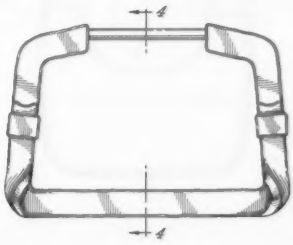


238,033
ARMCHAIR
Cesare Cassina, Carimate, Italy, assignor to Centro Cassina S.r.l., Copreno di Lentate sul Seveso, Milan, Italy
Filed Feb. 5, 1974, Ser. No. 440,129
Claims priority, application Italy Aug. 30, 1973
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

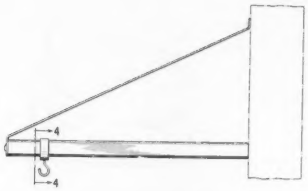


238,034
CHAIR
Leonard Eisen, 14 Lomas Lane, Montvale, N.J. 07645
Filed Mar. 25, 1974, Ser. No. 454,735
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—74

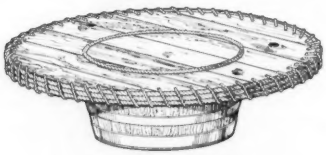
238,035
TOWEL RING
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Original design application Jan. 4, 1974, Ser. No. 430,939. Divided and this application Sept. 3, 1974, Ser. No. 502,526
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—99



238,036
HANGER FOR A PLANT CONTAINER
Leonard Entin and Leon A. Gainsboro, Wayland, Mass., assignors to Opus, Incorporated, Boston, Mass.
Filed Oct. 9, 1974, Ser. No. 513,457
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—137



238,037
COFFEE TABLE
Donald B. Gold, San Rafael, Calif., assignor to K.I.S.S. Industries, Inc., San Rafael, Calif.
Filed Sept. 3, 1974, Ser. No. 502,603
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—147

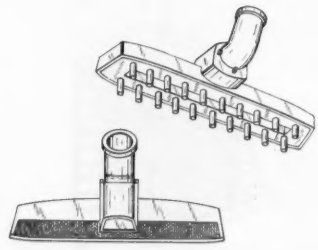


238,038
HIGH CHAIR TRAY
Raymond A. Lo Turco, Columbus, Inc., assignor to Cosco, Inc., Columbus, Ind.
Filed Jan. 24, 1974, Ser. No. 436,100
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—199

238,039
COMBINED CHILD'S DISH AND BASE THEREFOR
Sven-Eric Juhlin, Gustavsberg, Sweden, assignor to AB Gustavsbergs Fabriker
Original design application June 19, 1972, Ser. No. 264,251, now Patent No. 233,972. Divided and this application Feb. 14, 1974, Ser. No. 442,487
Claims priority, application Sweden Dec. 21, 1971
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—23

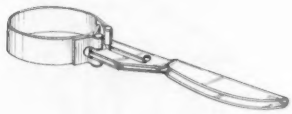
238,040
TABLE FOR BARBECUE GRILL
Richard D. Hardy, 135 Meadowview Drive, Buchanan, Mich. 49107
Filed June 28, 1974, Ser. No. 483,947
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D7—107

238,041
SHAG RUG CARPET CLEANER HEAD
Sam G. Cox, P.O. Box 480, Hoyt Lakes, Minn. 55750
Filed Jan. 2, 1973, Ser. No. 320,559
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—173

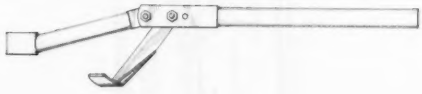


238,042
BLADE FOR MULTIPURPOSE GARDENING TOOL
Johann Frederick Anker, 39 Neeron Road, Blairgowrie, Randburg, Republic of South Africa
Filed Nov. 19, 1973, Ser. No. 417,098
Claims priority, application Republic of South Africa Aug. 1, 1973
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—9

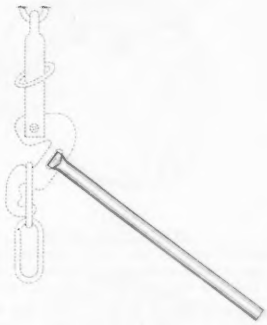
238,043
ADJUSTABLE OIL FILTER WRENCH
Donald J. Shanklin, Granada Hills, Calif., assignor to Orion Industries, Inc., Torrance, Calif.
Filed Nov. 18, 1974, Ser. No. 524,637
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—22



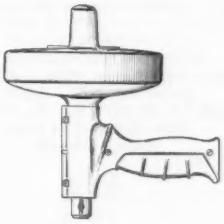
238,044
TOOL USED IN SEPARATING A TIRE BEAD FROM ITS SEAT ON A WHEEL
Mieczyslaw Majek, Birmingham, England, assignor to Dunlop Limited, London, England
Filed Dec. 14, 1973, Ser. No. 424,828
Claims priority, application Great Britain June 15, 1973
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—31



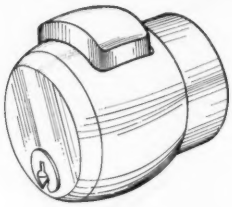
238,045
TIRE CHAINING TOOL
John R. Hutton, 837 Morning Glory St., West Sacramento, Calif. 95691
Filed Oct. 24, 1974, Ser. No. 517,479
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—31



238,046
PLUMBING CLEANOUT DEVICE
Aaron J. Levine, 3147 N. Cambridge Ave., Chicago, Ill. 60657
Filed Aug. 28, 1974, Ser. No. 501,049
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—68

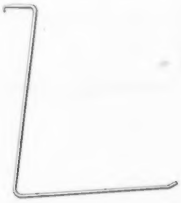


238,047
DOOR HANDLE WITH A LOCK-ACTUATING PUSH BUTTON OR SIMILAR ARTICLE
Giuliandrea Meroni, Via Diaz 21, Nova Milanese, Milan, Italy
Filed Feb. 4, 1974, Ser. No. 439,136
Claims priority, application Italy Sept. 21, 1973
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—147



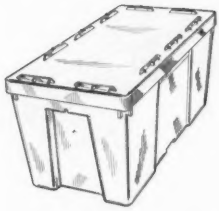
238,048
SWITCH COVER
Anton Bertoncel, Rua 9 de Julho 545, Sao Paulo, Brazil
Filed Apr. 18, 1973, Ser. No. 352,297
Term of patent 7 years
Int. Cl. D8—*09*
U.S. Cl. D8—181

238,049
WINDOW BOX SUPPORT
Richard R. Hertzel, 19 Bruen Court, Rensselaer, N.Y. 12144
Filed Feb. 21, 1974, Ser. No. 444,214
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—242



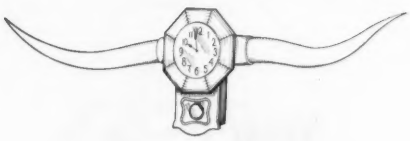
238,050
COMBINED CRUET AND STOPPER
Peter L. Schweizer, Liberty Center, Ohio, assignor to Owens-Illinois, Inc.
Continuation-in-part of design application Ser. No. 458,132, Apr. 5, 1974. This application Apr. 24, 1974, Ser. No. 463,665
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—156

238,051
CONTAINER
Edward J. Fier, Jr., 572 Killarney Pass, Mundelein, Ill. 60060
Filed Nov. 12, 1973, Ser. No. 415,228
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—240

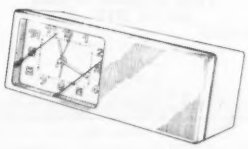


238,052
CABINET COVER
Charles C. Boris, 228 Glen Oaks Ave., Temple Terrace, Fla. 33617
Filed Dec. 8, 1972, Ser. No. 313,401
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—259

238,053
CLOCK
Seward W. Johnson and John Moore, both of 1506 Oakley Park Road, Walled Lake, Mich. 48088
Filed Oct. 12, 1973, Ser. No. 406,313
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—7

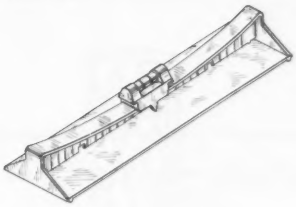


238,054
CLOCK
Yukinobu Funahashi, Mitaka, Japan, assignor to Citizen Watch Co., Tokyo, Japan
Filed May 17, 1974, Ser. No. 471,052
Claims priority, application Japan Nov. 21, 1973
Term of patent 7 years
Int. Cl. D10—*01*
U.S. Cl. D10—24

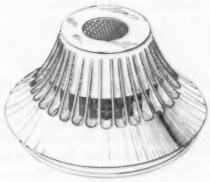


238,055
WATCH CASE
Norio Seshimo, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha Japan
Filed Nov. 30, 1973, Ser. No. 420,467
Claims priority, application Japan June 7, 1973
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

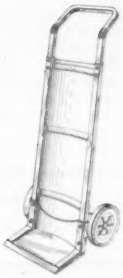
238,056
SPIRIT LEVEL INCLINOMETER
Jack B. Foster and Jack E. Antes, Santa Ana, Calif., assignors to Super Seer Corporation, Evergreen, Colo.
Filed Sept. 10, 1973, Ser. No. 396,005
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—69



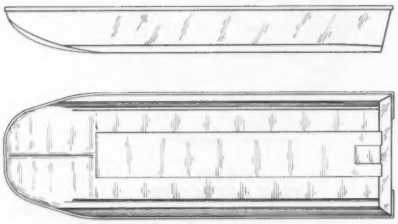
238,057
FIRE DETECTOR
Duane D. Pearsall and Alvin A. Mayer, Littleton, Colo., assignors to Statitrol Corporation, Lakewood, Colo.
Filed Oct. 10, 1973, Ser. No. 405,147
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



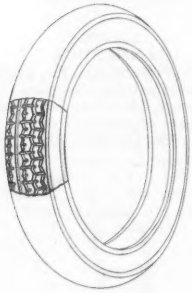
238,058
HANDTRUCK
Georg L. Weyrauch, Philadelphia, Pa., assignor to Gulf + Western Manufacturing Company (Systems)
Filed Oct. 9, 1973, Ser. No. 404,476
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—34



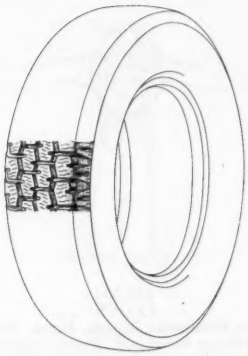
238,059
BOAT HULL
Fern Lee Cook, 8124 E. 124th St., Bixby, Okla. 74008
Filed Jan. 28, 1974, Ser. No. 437,357
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



238,060
TIRE FOR A VEHICLE WHEEL
Nobuyuki Sakaki, Kobe, Japan, assignor to Dunlop Limited, London, England
Filed Feb. 8, 1974, Ser. No. 440,776
Claims priority, application Japan Aug. 10, 1973
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

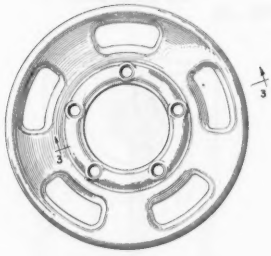


238,061
TIRE
Andre E. J. Baus, Welsdorf, Luxembourg, assignor to The Goodyear Tire & Rubber Company
Filed Feb. 28, 1974, Ser. No. 446,995
Claims priority, application Great Britain Nov. 9, 1973
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—148

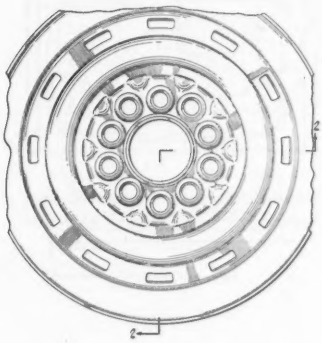


238,062
WINDSHIELD WIPER BLADE UNIT
Joseph R. Bourassa, Trumbull, and Manuel Lopez, Huntington, Conn., assignors to Parker Hannifin Corporation, Shelton, Conn.
Filed Sept. 13, 1974, Ser. No. 505,736
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

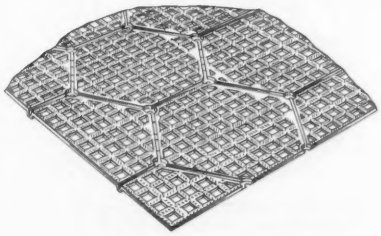
238,063
WHEEL CENTER
Richard H. Clement, 10900 Jann Court, La Grange, Ill. 60525
Filed Nov. 5, 1973, Ser. No. 412,805
Term of patent 14 years
The term of this patent subsequent to Jan. 9, 1987, has been disclaimed
Int. Cl. D12—*16*
U.S. Cl. D12—209



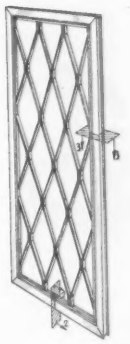
238,064
WHEEL
James L. Brainard, Temple City, and Robert J. Palm, Brea, Calif., assignors to Whittaker Corporation
Continuation-in-part of abandoned design application Ser. No. 191,579, Oct. 21, 1971, and a division of design application Ser. No. 262,948, June 15, 1972, now Patent No. 229,558. This application Mar. 16, 1973, Ser. No. 342,220
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—210



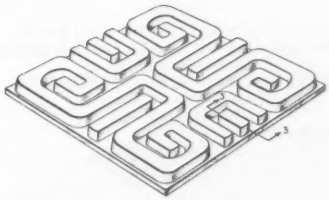
238,065
PLAYING SURFACE MODULE FOR ATHLETIC ACTIVITIES SUCH AS TENNIS COURTS, SWIMMING POOL AREAS, AND THE LIKE
Wilfred G. Harvey, 42 Sullivan Way, East Brunswick, N.J. 08816
Filed Sept. 29, 1972, Ser. No. 293,406
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1 J



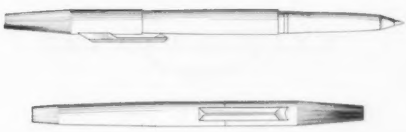
238,066
DOOR
Ronald McKenzie Howells, Yennora, New South Wales, Australia, assignor to Comalco (J & S) Pty. Limited
Filed Nov. 6, 1972, Ser. No. 303,852
Claims priority, application Australia June 8, 1972
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1 M



238,067
PANEL FOR A DOOR
Frederick V. Caropresi, Pittsburgh, Pa., assignor to Pease Company, Fairfield, Ohio
Filed Dec. 11, 1972, Ser. No. 314,258
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 J

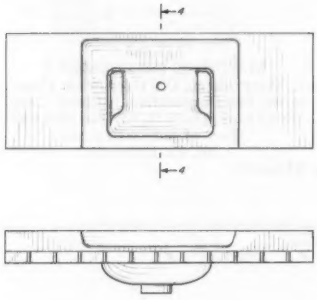


238,068
MARKING INSTRUMENT
William E. Maryynissen, Old Greenwich, Conn., assignor to Bic Pen Corporation, Milford, Conn.
Filed Mar. 13, 1974, Ser. No. 450,687
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—45

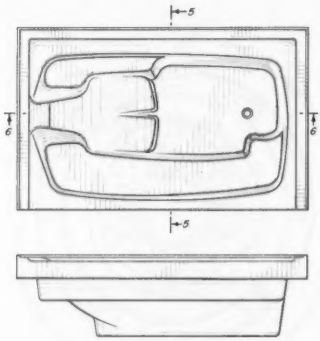


238,069
PRESSURE PUMP FOR TENNIS BALL CANNISTERS OR SIMILAR ARTICLE
Robert B. Dubner, 40 Dogwood Ave., and Harold Bienenfeld, 145 Dogwood Ave., both of Roslyn Harbor, N.Y. 11576
Filed May 23, 1974, Ser. No. 472,721
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—15

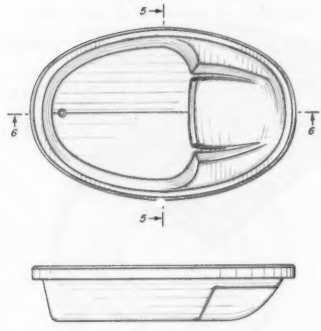
238,070
COMBINED VANITY TOP AND BASIN
Richard J. Ganger, Los Angeles, Calif., assignor to Dimensionetix, Inc.
Filed Oct. 4, 1974, Ser. No. 512,051
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58



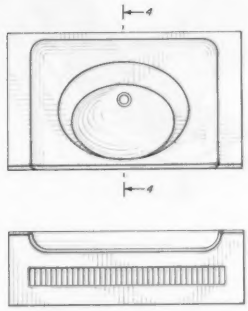
238,071
BATH TUB
Richard J. Ganger, Los Angeles, Calif., assignor to Dimensionetix, Inc.
Filed Oct. 4, 1974, Ser. No. 512,052
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



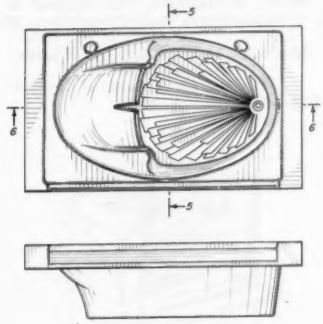
238,072
BATHTUB
Richard J. Ganger, Los Angeles, Calif., assignor to Dimensionetix, Inc.
Filed Oct. 4, 1974, Ser. No. 512,053
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



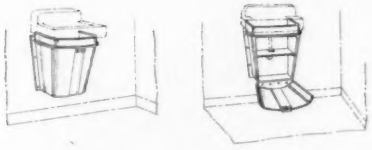
238,073
LAVATORY
Richard J. Ganger, Los Angeles, Calif., assignor to Dimensionetix, Inc.
Filed Oct. 4, 1974, Ser. No. 512,056
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58



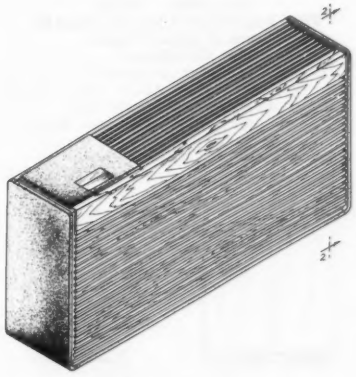
238,074
BATH TUB
George S. Gruber, Hidden Hills, Calif., assignor to Dimensionetix, Inc.
Filed Oct. 4, 1974, Ser. No. 512,213
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



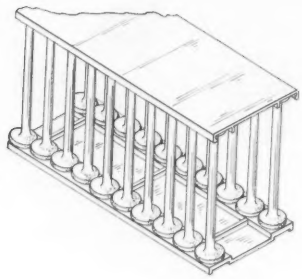
238,075
CABINET FOR COVERING LAVATORY PIPES
Ulysses Harris, Westfield, N.J., assignor to Ten-O-Feb., Inc., Westfield, N.J.
Filed Dec. 20, 1973, Ser. No. 426,803
Term of patent 3½ years
Int. Cl. D6—*04*; D23—*02*
U.S. Cl. D23—59



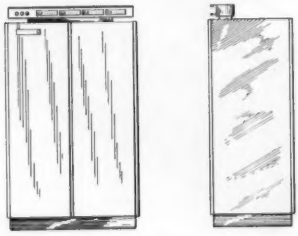
238,076
WALL MOUNTED HOUSING FOR AN AIR CONDITIONER OR SIMILAR ARTICLE
Jon M. Newgard and Charles F. Schultz, Louisville, Ky., assignors to General Electric Company
Filed Oct. 15, 1974, Ser. No. 514,375
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—141



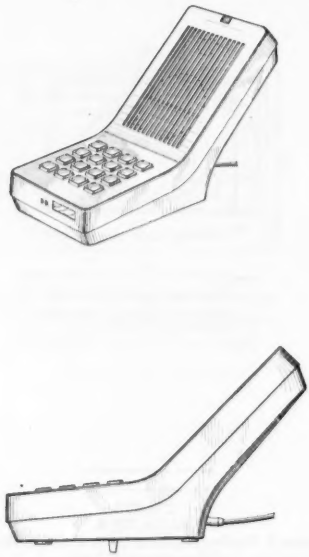
238,077
WIRING DUCT
Philip W. Taylor, Howell, Mich., assignor to Taylor Industries, Inc., Howell, Mich.
Filed Feb. 6, 1974, Ser. No. 440,147
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 R



238,078
TAPE CONTROLLER FOR MAGNETIC TAPE DECKS
John H. Wilson, 6422 E. 41st St., Tulsa, Okla. 74135
Filed June 27, 1973, Ser. No. 374,246
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

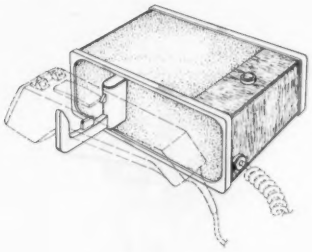


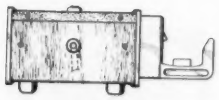
238,079
TELEPHONE SET
Per Erik Edward Heribertson, Lidingo, and Rolf Bertil Andren, Bandhagen, Sweden, assignors to International Standard Electric Corporation, New York, N.Y.
Filed Jan. 2, 1974, Ser. No. 430,278
Claims priority, application Sweden July 5, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



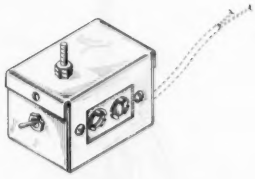
238,080
ELECTROMECHANICAL STORAGE AND RETRIEVAL UNIT
Paul W. Porter, Phoenixville, Pa., assignor to Sperry Univac Division, Sperry Rand Corporation, Blue Bell, Pa.
Filed Mar. 13, 1974, Ser. No. 450,643
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

238,081
REMOTE STATION FOR DICTATING EQUIPMENT
James C. Sturrock, Atlanta, Ga., assignor to Robert N. Fink, Decatur, Ga.
Filed Mar. 14, 1974, Ser. No. 451,123
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B

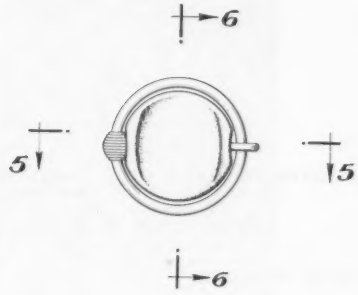




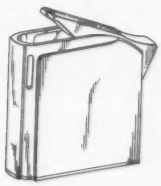
238,082
SWITCH FOR TV CABLE AND ANTENNA
James C. Matthews, 115 Harding Drive, Washington, N.J. 07882
Filed July 19, 1974, Ser. No. 490,135
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R



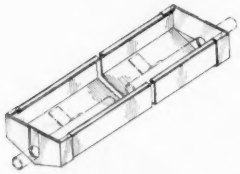
238,083
COMBINED CIGARETTE HOLDER AND REMOVABLE SUPPORT
Eugene R. Cuthbertson, 116 "B" Surfside Colony, Surfside, Calif. 90743
Filed Dec. 10, 1973, Ser. No. 423,300
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—7



238,084
CIGARETTE LIGHTER
Kenjiro Goto, 28–13, 5-chome, Setagaya-ku, Sakurajosui, Tokyo, Japan
Filed Dec. 13, 1973, Ser. No. 424,480
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

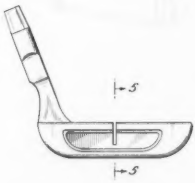


238,085
POULTRY FEEDER TROUGH
Gerald L. Kitson, 9709 Belding Road, Rockford, Mich. 49341
Continuation of design application Ser. No. 160,245, July 6, 1971, now Patent No. 229,030, dated Nov. 6, 1973. This application Oct. 23, 1973, Ser. No. 408,373
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

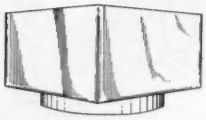


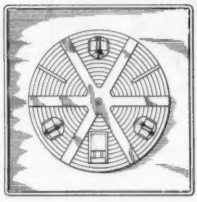
238,086
COVER FOR GOLF CLUB CARRYING CASE
John L. Findeisen, 11026 S. Avenue L, Chicago, Ill. 60617
Filed Oct. 12, 1973, Ser. No. 405,931
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GB

238,087
GOLF PUTTER HEAD
Raymon W. Cook, 406 Top Hill, San Antonio, Tex. 78209
Continuation of abandoned design applications Ser. No. 293,532, and Ser. No. 293,533, both Sept. 29, 1972, and Ser. No. 343,388, Mar. 21, 1973. This application June 14, 1974, Ser. No. 479,455
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



238,088
VAT FOR AN INDOOR GARDEN
Raymond Grosfillex, Arbent, France, assignor to Grosfillex S.A.R.L., Arbent, France
Filed Oct. 5, 1972, Ser. No. 295,106
Claims priority, application France Apr. 20, 1972
Term of patent 7 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A



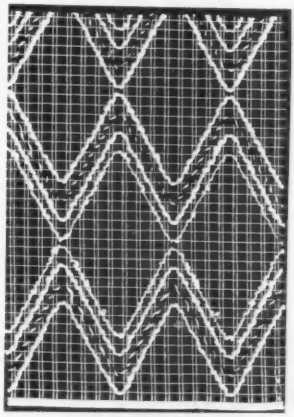


238,089
PENDANT OR SIMILAR ARTICLE
Eugene A. Poulin, 85 Royal Oak Road, New Britain, Conn. 06053
Continuation-in-part of abandoned design application Ser. No. 344,471, Mar. 26, 1973. This application June 12, 1974, Ser. No. 478,641
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—17

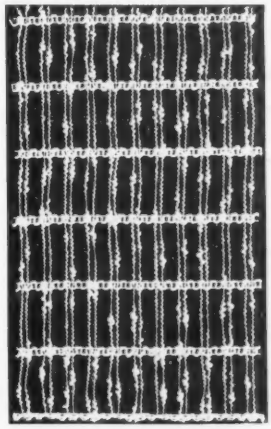
238,090
PENDANT OR SIMILAR ARTICLE
Eugene A. Poulin, 85 Royal Oak Road, New Britain, Conn. 06053
Continuation-in-part of abandoned design application Ser. No. 344,472, Mar. 26, 1973. This application June 12, 1974, Ser. No. 478,642
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—17

238,091
PENDANT OR SIMILAR ARTICLE
Hugh H. Harding, 1306 N. Scouller, Wichita, Kans. 67212
Filed July 22, 1974, Ser. No. 490,878
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—19 V

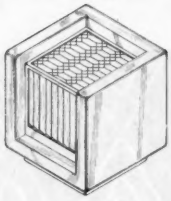
238,092
CURTAIN PATTERN
Peter Eric Schroeder, Oberwil, near Brenngarten, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed May 10, 1974, Ser. No. 469,014
Claims priority, application Germany Nov. 12, 1973
Term of patent 14 years
Int. Cl. D5—*02*
U.S. Cl. D47—6 E



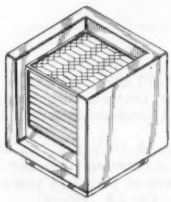
238,093
CURTAIN PATTERN
Peter Eric Schroeder, Oberwil, near Brenngarten, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed May 10, 1974, Ser. No. 469,022
Claims priority, application Germany Nov. 12, 1973
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D47—6 E



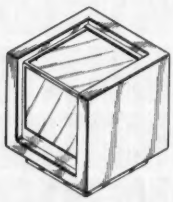
238,094
LIGHTING FIXTURE
Roger N. Ervin, 9647 Leaside Drive, Dallas, Tex. 75238
Filed Oct. 24, 1973, Ser. No. 409,071
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31



238,095
LIGHTING FIXTURE
Roger N. Ervin, 9647 Leaside Drive, Dallas, Tex. 75238
Filed Oct. 24, 1973, Ser. No. 409,072
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31



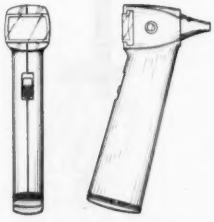
238,096
LIGHTING FIXTURE
Fred O. Delin, 5656 Celestial Road, Dallas, Tex. 75240
Filed Oct. 24, 1973, Ser. No. 409,143
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31



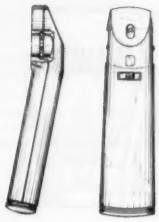
238,097
COMBINED TAIL LIGHT AND SUPPORT BRACKET FOR BOAT TRAILERS
James A. Driscoll, 1219 Garfield, Sand Springs, Okla. 74063
Filed Apr. 22, 1974, Ser. No. 462,607
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 R

238,098
PORTABLE RADIO
David H. Fink, 52 Fox Lane, Dix Hills, N.Y. 11746
Filed Mar. 4, 1974, Ser. No. 447,658
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

238,099
OTOSCOPE
Arthur J. Pulos, Fayetteville, N.Y.
Filed Jan. 7, 1974, Ser. No. 431,476
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D57—1 E

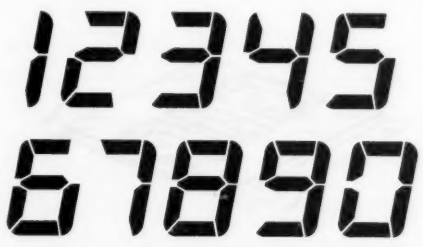


238,100
OPHTHALMOSCOPE
Arthur J. Pulos, Fayetteville, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.
Filed Jan. 7, 1974, Ser. No. 431,477
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D57—1 E

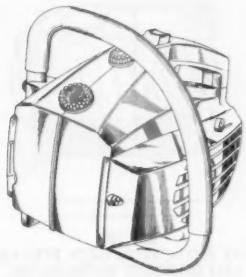


238,101
COMBINED LABEL PRINTER AND APPLICATOR
Robert P. Mulholland, Centerville, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Filed June 5, 1974, Ser. No. 476,485
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—10

238,102
NUMERAL FONT OR SIMILAR ARTICLE
William S. Dolan, Middlebury, Conn., assignor to Gruen Industries, Inc., New York, N.Y.
Filed July 24, 1974, Ser. No. 491,334
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B

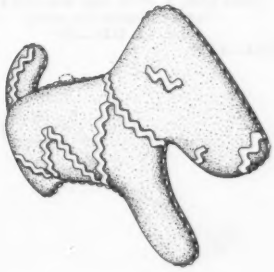


238,103
POWER CHAIN SAW ENGINE ASSEMBLY
Lloyd H. Tuggle, Shreveport, La., assignor to Emerson Electric Company, St. Louis, Mo.
Filed Oct. 12, 1973, Ser. No. 406,035
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D77—1 R

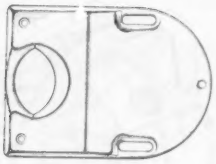


238,104
COMBINED VIBRATOR AND CUSHION
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.
Filed July 23, 1973, Ser. No. 381,679
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 S

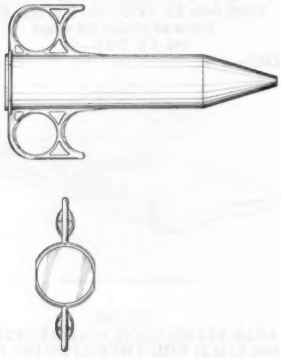
238,105
REFILLABLE FLUID CONTAINER USED TO APPLY HEAT OR COLD FOR THERAPEUTIC PURPOSES
Edith C. Amend, 10 Maher Ave., Greenwich, Conn. 06830
Filed Sept. 17, 1973, Ser. No. 397,795
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D83—1 P



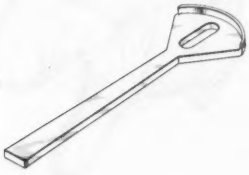
238,106
RESUSCITATION BOARD
Dennis Arblaster, 34081 La Serena, Dana Point, Calif. 92629
Filed Mar. 15, 1974, Ser. No. 451,461
Term of patent 14 years
Int. Cl. D21—*02*; D24—*02*
U.S. Cl. D83—1 G



238,107
CEMENT INJECTION GUN FOR USE IN TOTAL JOINT SURGERIES
Ricardo J. Heros, Memphis, Tenn., assignor to Richards Manufacturing Company, Inc., Memphis, Tenn.
Filed Mar. 29, 1974, Ser. No. 456,274
Term of patent 7 years
Int. Cl. D24—*02*
U.S. Cl. D83—12 A

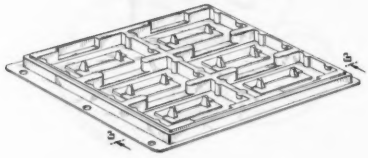


238,108
TONGUE CLEANER
Gladys E. Cooke, 11246 S. Post Oak, Suite 218, Houston, Tex. 77035
Filed Mar. 3, 1975, Ser. No. 554,918
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—12 R

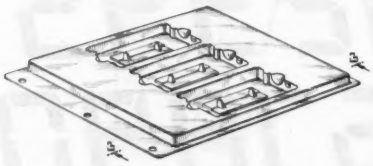


238,109
COMBINED NOZZLE AND COMB FOR HAIR DRYERS
Michael G. Vitetta, 311 Fenimore Road, Mamaroneck, N.Y. 10543
Filed Nov. 12, 1973, Ser. No. 415,014
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F

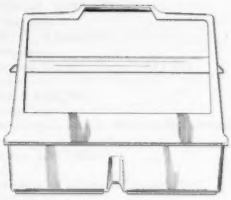
238,110
HOLDER FOR MAGNETIC TAPE CASSETTES
Richard Shyers, 737 Evergreen Parkway, Union, N.J. 07083
Filed Nov. 12, 1973, Ser. No. 414,703
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 D



238,111
MAGNETIC TAPE CASSETTE HOLDER
Richard Shyers, 737 Evergreen Parkway, Union, N.J. 07083
Filed Nov. 12, 1973, Ser. No. 414,712
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 D

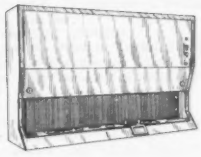


238,112
UTILITY CASE
Ralph M. Nowak, Wilbraham, Mass., assignor to Tucker Cosco, Inc., Columbus, Ind.
Filed Dec. 26, 1973, Ser. No. 427,923
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R

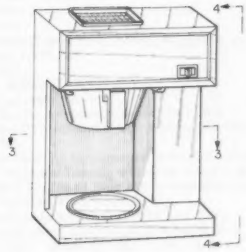


238,113
TOOL BOX
Donald G. Hart, R.R. 1, Geneseo, Ill. 61254
Filed Nov. 8, 1973, Ser. No. 413.877
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R

238,114
LIQUOR DISPENSER
David R. Jones, R.R. 4, Box 21B, Little Cub Road, Evergreen, Colo. 80439
Filed Sept. 7, 1973, Ser. No. 395,356
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D94—3 B



238,115
COFFEE BREWER
Vincent G. Marotta, Shaker Heights, Ohio, assignor to North American Systems, Inc., Shaker Heights, Ohio
Filed Oct. 19, 1973, Ser. No. 407,932
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D94—3 B



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF DECEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & A Engineering Co.: *See—*
Neff, Frederick R., 3,926,062.

A. O. Smith Harvestore Products, Inc.: *See—*
Hogarth, Robert E., 3,926,814.

A/S E. Rasmussen: *See—*
Lambertsen, Ejvind, 3,927,351.

AB Essve Produkter: *See—*
Filen, Bjorn G. O., 3,926,598.

AB Fodervavnader: *See—*
Broms, Bengt; and Wager, Oleg, 3,925,994.

AB Svedieselt: *See—*
Engwall, Bertil, 3,926,250.

Abbott Laboratories: *See—*
Crovetti, Aldo Joseph; Blank, Artur; and Germann, Richard Paul, 3,927,100.
Lee, Cheuk Man, 3,927,036.

Abe, Masao: *See—*
Nakanishi, Michio; Yokobe, Tetsuo; Arai, Tomio; and Abe, Masao, 3,927,011.

Abex Corporation: *See—*
Frank, Earl E., 3,926,124.

Abney, Dave L.; Williams, Robert C.; and Gilbert, Horace E., to Dresser Industries, Inc. Selective well treating and gravel packing apparatus. 3,926,409, Cl. 251-344.000.

Abson, David J.; and Gurney, Ferdinand J., to United States of America, Air Force. Heated die assembly. 3,926,029, Cl. 72-342.000.

Abu-Isa, Ismat A., to General Motors Corporation. Platable polypropylene. 3,926,932, Cl. 260-93.700.

Acevedo, Generoso, to International Telephone and Telegraph Corporation. Sequence control circuit for telephone systems. 3,927,271, Cl. 179-18.0AB.

Ackeret, Peter, to IISI Products AG. Container for 8-track tape cartridges. 3,926,310, Cl. 206-387.000.

Ackerman, James H., to Sterling Drug Inc. Cyclic imides of 3-substituted 2,4,6-triiodoanilines. 3,926,975, Cl. 260-243.00B.

Acre, Leon R.: *See—*
Kurichh, Sham L.; and Acre, Leon R., 3,926,094.

Adachi, Hiroyuki: *See—*
Huang, Ching Yun; Shimizu, Senzo; and Adachi, Hiroyuki, 3,926,890.

Adachi, Tetsuo: *See—*
Takayama, Kenichiro; Adachi, Tetsuo; Kohata, Mamoru; Hattori, Kiyoji; and Tomiyama, Tomoko, 3,926,724.

Adachi, Yoichi; and Harada, Yoshiharu, to Mitsui & Co. Ltd. Detection system for protecting anodes in flowing mercury cathode electrolytic cells. 3,926,750, Cl. 204-99.000.

Adahan, Carmeli, to Singer Company, The. Hammerless impact printer. 3,926,295, Cl. 197-55.000.

Adams, Charles D., to Du Pont de Nemours, E. I., and Company. Alkyl 4-[o-(substituted amino)phenyl]-3-thioallophanates. 3,927,069, Cl. 260-470.000.

Adams, James D. Truss assembly jig. 3,925,870, Cl. 29-200.00J.

Adams, Kenneth D.: *See—*
Herron, William; Adams, Kenneth D.; and Petronchak, John, 3,926,133.

Adams, Stuart Sanders; Armitage, Bernard John; Bristow, Norman William; and Heathcote, Bernard Vincent, to Boots Company Limited, The. Xanthen derivatives. 3,927,029, Cl. 260-335.000.

Admirant, Jacobus Den: *See—*
Vos, Cornelis; and Admirant, Jacobus Den, 3,927,211.

Adolf Hofmann Metall- u. Kunstoffwarenfabrik GmbH: *See—*
Schickedanz, Gerhard, 3,926,327.

Adsetts, John Robert, to Imperial Chemical Industries Limited. Catalyst and catalytic process. 3,926,584, Cl. 48-214.000.

Aeroquip Corporation: *See—*
Crissy, Charles F.; Sherwin, Owen W.; and Corbin, Christopher L. T., 3,926,467.

Agfa-Gevaert: *See—*
Claes, Frans Henri, 3,926,654.
Van den Houte, Jozef Willy, 3,926,630.

Agfa-Gevaert, a naamloze vennootschap: *See—*
Verreydt, Jan Baptist, 3,926,664.

Agfa-Gevaert AG: *See—*
Winkler, Alfred, 3,926,313.

Agfa-Gevaert Aktiengesellschaft: *See—*
Saleck, Wilhelm; Engelhard, Helmut; Himmelmann, Wolfgang; Bentz, Francis; and Mader, Helmut, 3,926,635.

Agfa-Gevaert, N.V.: *See—*
Hofman, Emiel Alexander; Berendsen, Jules Robert; and Pollet, Robert Joseph, 3,926,632.

Ahland, Erwin: *See—*
Schmalfeld, Paul; Sauter, Dieter; Peters, Werner; Ahland, Erwin; Bock, Burkhard; and Lehmann, Joachim, 3,926,576.

Ahrendt, William A.: *See—*
Beggs, Donald; and Ahrendt, William A., 3,926,617.

Ahrweiler, Karl-Heinz, to Kusters, Eduard. Continuous press. 3,926,542, Cl. 425-174.400.

Aibe, Toshio; Mochida, Seiji; and Itoga, Kiyoshi, to Takeda Chemical Industries, Ltd. Process for treatment of waste gases. 3,926,590, Cl. 55-68.000.

Aiken, William B.: *See—*
Williams, Leonard E., Jr.; and Aiken, William B., 3,926,457.

Airwick Industries, Inc.: *See—*
Gibellina, Michael C., 3,926,667.

Aishima, Itsuho; Kitaoka, Atsushi; Koseki, Toshinori; Suzuki, Sachio; Arimoto, Kenji; and Matsumoto, Koichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Thermoplastic material compositions. 3,926,873, Cl. 260-18.00R.

Aisin Seiki Kabushiki Kaisha: *See—*
Shibatani, Juichi; and Kondo, Toshiyuki, 3,926,480.

Ajinomoto Co., Inc.: *See—*
Ichikawa, Tomomichi; and Fukami, Sigetosi, 3,927,047.

Akashi, Hiromitsu: *See—*
Fujiwara, Susumu; Okada, Takao; Koyama, Masao; Akashi, Hiromitsu; and Nishikawa, Yoichi, 3,927,309.

Aker, Jimmie R.: *See—*
Cullen, Ray H.; and Aker, Jimmie R., 3,926,269.

Akita, Eiichi: *See—*
Kondo, Shinichi; Sezaki, Masaji; Koike, Makiko; Shimura, Masaru; Akita, Eiichi; Satoh, Kimio; Hamamoto, Kazuko; Niida, Taro; and Hara, Takeshi, 3,926,948.

Akiyama, Hisao: *See—*
Tobiki, Hisao; Okamoto, Tadashi; and Akiyama, Hisao, 3,927,054.

Aktiebolaget Atomenergi: *See—*
Lysell, Gunnar, 3,926,721.

Aktiebolaget Svenska Flaktfabriken: *See—*
Bockman, Ole Kristian, 3,926,595.
Matts, Sigvard, 3,926,586.

Aktiengesellschaft Adolph Saurer: *See—*
Porter, Allan William Henry, 3,926,226.

Akzo N. V.: *See—*
Zengel, Hans-Georg; Toth, Anton; Magerlein, Helmut; and Meyer, Gerhard, 3,927,085.

Akzo N.V.: *See—*
de Klein, Willem J., 3,927,051.

Akzona Incorporated: *See—*
van den Broek, Albertus Joannes, 3,927,046.

Albert, Karmen D. Mechanical hair feeding electric razor. 3,925,889, Cl. 30-43.800.

Albertson, Clarence E.; and Krueger, Robert H., to Borg-Warner Corporation. Composite bearing materials. 3,926,818, Cl. 252-12.400.

Alburger, James R. Closed-loop water-washable inspection penetrant process. 3,926,044, Cl. 73-104.000.

Alcan Research and Development Limited: *See—*
Morris, Larry Roy; and Miners, Frederick Barry, 3,926,690.

Alexander, John. Floating golf ball retriever. 3,926,464, Cl. 294-19.00A.

Alfa-Laval AB: *See—*
Rosen, Ernst Anders Carl-Gustaf; and Rosen, Helena Mariana, 3,926,732.

Alfa Romeo S.p.A.: *See—*
Busso, Giuseppe, 3,926,070.

Algoma Steel Corporation, Limited, The: *See—*
Creswick, William E.; and Hunt, Patrick J., 3,926,686.

All Orthopedic Appliances Inc.: *See—*
Spiro, Irving, 3,926,183.

All State Vending Equipment, Inc.: *See—*
Selvia, Ray E.; and Barden, Allan D., 3,926,342.

All-Steel Inc.: *See—*
Deming, Dale R.; and Datschefski, Arthur E., 3,926,330.

Allen, James H.; and Green, Frederic L. Implantable valve for medical purposes. 3,926,175, Cl. 128-1.00R.

Allen, James S.; and Craig, John D., Jr., to Du Pont de Nemours, E. I., and Company. Process for electrophoretic deposition of polymer. 3,926,760, Cl. 204-181.000.

Alley, Lawrence Everett, III, to ARCO Medical Products Company. Demand heart pacer. 3,926,197, Cl. 128-419.0PT.

Allied Chemical Corporation: *See—*
Figiel, Francis J.; and Anderson, Roland W., 3,926,862.
Garofano, Norman R.; and Port, Eugene B., 3,927,175.

Alsop, Arthur Graham, to Strachan & Henshaw Limited. Spray dampening apparatus. 3,926,115, Cl. 101-148.000.

Alt, Gerhard H., to Monsanto Company. 1-(Naphthyl and naphthyloxy-acetyl-2,2-dialkyl hydrazine acids and their use as herbicides. 3,926,613, Cl. 71-118.000.

Altstadter Verpackungs-Vertriebs GmbH: *See—*
Reil, Wilhelm, 3,927,297.

Alza Corporation: *See—*
Baker, Richard W.; and Gale, Robert M., 3,926,188.

Amano, George Minoru: *See—*
Petty, John Lee; and Amano, George Minoru, 3,926,874.

Amchem Products, Inc.: *See—*
Damiano, John Joseph, 3,927,127.
Francke, Wittko; and Heemann, Volker, 3,927,207.
Amerace Corporation: *See—*
Heenan, Sidney A., 3,926,402.
American Brands, Inc.: *See—*
Kelly, James G., 3,925,904.
American Cyanamid Company: *See—*
Tucker, Robert Jerome, 3,926,835.
American Glass Research, Inc.: *See—*
Smith, Everett C., 3,926,103.
American Home Products Corporation: *See—*
Grant, Norman H.; and Sarantakis, Dimitrios, 3,926,937.
Hersh, Marvin, 3,927,196.
Lippmann, Wilbur, 3,927,213.
McCaully, Ronald J., 3,926,952.
Nudelman, Abraham; and McCaully, Ronald J., 3,926,974.
Teller, Daniel M.; Sellstedt, John H.; and Guinosso, Charles J., 3,926,984.
American Newspaper Publishers Association: *See—*
Merker, George; Krupp, Joseph; Ricards, Charles R.; and Ward, Thomas A., 3,926,423.
American Optical Corporation: *See—*
Richards, William; and Grolman, Bernard, 3,925,825.
Shatzel, Norman W., deceased, 3,926,085.
Welter, Leonard M., 3,927,321.
American Telephone and Telegraph Co.: *See—*
Bloxham, Glen Lee; and Wells, Don Charles, 3,927,272.
Amos, Paul E. Storage attachment for tables, wall pictures, and the like. 3,926,488, Cl. 312-241.000.
Amot Controls Corporation: *See—*
Gripe, William B.; and Norman, Melvin H., 3,926,444.
AMP Incorporated: *See—*
Lerner, Lewis Brian, 3,926,748.
Amundson, Robert M.; and Brown, Robert M., to Atlantic Research Corporation. Signal identification system. 3,927,260, Cl. 179-1.0MN.
Anaconda Company, The: *See—*
Evankovich, Peter P.; Madden, Robert J.; and Peterson, Edward M., 3,926,241.
Anastasio, Frank J.: *See—*
Santa Maria, Richard C.; and Anastasio, Frank J., 3,926,097.
Andco Incorporated: *See—*
Lee, Sung Ki, 3,926,753.
Lee, Sung Ki, 3,926,754.
Andersen, Peder John, to P.M. Andersen Manufacturing Pty. Limited. Welding metal grating ends. 3,927,294, Cl. 219-107.000.
Anderson, Clayton & Co.: *See—*
Circle, Sidney Joseph; Fergle, Richard Raymond; Watkins, Leslie Ray; and Hooton, Daniel Edwards, 3,926,940.
Anderson, John E., to Phillips Petroleum Company. Controlled fractionation method and apparatus. 3,926,742, Cl. 203-3.000.
Anderson, Merlin F.: *See—*
Evans, Robert T.; Cummins, Alonzo E.; and Anderson, Merlin F., 3,926,254.
Anderson, Noel M.; and Otto, Arlin W., to Merrill Manufacturing Company, Inc. Yard hydrant. 3,926,206, Cl. 137-281.000.
Anderson, Noel M.; and Otto, Arlin W., to Merrill Manufacturing Company, Inc. Yard hydrant. 3,926,207, Cl. 137-281.000.
Anderson, Norman Stewart, to Imperial Chemical Industries Limited. Process for polymerizing lactams in the presence of azodicarboxylate and isocyanate. 3,926,865, Cl. 260-2.50N.
Anderson, Roland M., to Modcom, Inc. Orthodontic anchorage. 3,925,893, Cl. 32-14.00A.
Anderson, Roland W.: *See—*
Figiel, Francis J.; and Anderson, Roland W., 3,926,862.
Andersson, Kjell Arne, to Husqvarna AB. Lawn mower with a side outlet. 3,925,972, Cl. 56-320.200.
Andersson, Leif Helmer, to Facit Aktiebolag. Keyboard switch assembly having coil spring contacts providing point contacts engagement. 3,927,284, Cl. 200-5.00R.
Ando, Tetsuo; and Hirata, Yoshimi, to Sony Corporation. Charge transfer device. 3,927,418, Cl. 357-24.000.
Andre, Jacques M. J. G.: *See—*
Cahen, Raymond M.; Debus, Henri R.; and Andre, Jacques M. J. G., 3,926,852.
Andreikov, Evgeny Iosifovich; Kostromin, Alexandr Stepanovich; and Rusyanova, Natalya Dmitrievna. Method of simultaneous production of phthalic anhydride and anthraquinone. 3,927,040, Cl. 260-346.400.
Andreotti, John R., to United States of America, Navy. Far-infrared radiant intensity meter. 3,926,522, Cl. 356-51.000.
Andrew, Paul Hugh Finden; and Moxham, Kenneth Ewing, to Maunsell & Partners Pty. Limited. Dry docks. 3,925,999, Cl. 61-64.000.
Andrus, Ronald L.; and Reade, Richard F., to Corning Glass Works. Glass-ceramic articles with reflective surfaces. 3,926,602, Cl. 65-33.000.
Angeles Metal Trim Co.: *See—*
Costruba, Peter, 3,925,939.
Doke, Jack, 3,925,875.
Angelo Guala di Piergiacomo e Roberto Guala & C. S.A.S.: *See—*
Guala, Piergiacomo, 3,926,329.
Angliker, Hansjoerg: *See—*
Peter, Richard; and Angliker, Hansjoerg, 3,927,063.
Annand, Robert R.: *See—*
Zetlmeisl, Michael J.; May, Walter R.; and Annand, Robert R., 3,926,577.
Anno, James N.: *See—*
Fawcett, Sherwood L.; and Anno, James N., 3,927,329.
Antoni, Guido: *See—*
Neri, Paolo; Antoni, Guido; and Benvenuti, Franco, 3,927,204.
Antonini, Eraldo; and I.S.F. Societa per Azioni, to Snam Progetti S.p.A.; and I.S.F. Societa per Azioni. Method for carrying out enzymic reactions by means of the use of biphasic aqueous-organic systems. 3,926,726, Cl. 195-30.000.
Anvar, Agence National de Vaolirsation de la Recherche: *See—*
Machat, Jean-Yves; and Sohm, Jean-Claude, 3,926,677.
Aoki, Katsuo: *See—*
Ohno, Yoshitomo; Takigawa, Yasuko; Aoki, Katsuo; and Yashiki, Takatsuka, 3,927,205.
Appel, Eggert: *See—*
Seebode, Albert; Appel, Eggert; and Geisler, Gottfried, 3,926,049.
Appleton Electric Company: *See—*
Pearse, James N., 3,927,249.
Applied Materials, Inc.: *See—*
Schatz, Douglas S., 3,927,352.
Aqua-Chem, Inc.: *See—*
McClory, Robert M., 3,926,815.
Arai, Atsuaki; Oishi, Yasushi; Yamada, Minoru; Furutachi, Nobuo; and Nakamura, Kotaro, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 3,926,631, Cl. 96-29.00D.
Arai, Atsuaki: *See—*
Sugizaki, Atsushi; Hirose, Takeshi; Yokota, Yukio; Okumura, Akio; Oishi, Yasushi; and Arai, Atsuaki, 3,926,634.
Arai, Shigeru: *See—*
Koyanagi, Shunichi; Arai, Shigeru; Tajima, Shigenobu; and Kurimoto, Kazuhiko, 3,926,931.
Arai, Tomio: *See—*
Nakanishi, Michio; Yokobe, Tetsuo; Arai, Tomio; and Abe, Masao, 3,927,011.
Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha: *See—*
Shimizu, Katsuhisa; and Minami, Norio, 3,926,878.
Arakawa, Yoshihiro: *See—*
Nakashima, Akio; and Arakawa, Yoshihiro, 3,927,331.
Araki, Masaki: *See—*
Gondo, Hisashi; Eguchi, Naoki; Yoshimura, Takafumi; and Araki, Masaki, 3,926,687.
Archambault, Jacques Olivier; and McIrvine, John Douglas, to Canadian Industries Limited. Process for recovery of sulphur from sulphur dioxide. 3,927,191, Cl. 423-570.000.
ARCO Medical Products Company: *See—*
Alley, Lawrence Everett, III, 3,926,197.
Kolenik, Steve A., 3,926,198.
Arenco KM-AB: *See—*
Leander, Leif, 3,925,846.
Leander, Leif; and Eriksson, Curt, 3,925,847.
Arendale, Donald L. Carcass polisher. 3,925,845, Cl. 17-18.000.
Arimoto, Kenji: *See—*
Aishima, Itsuho; Kitaoka, Atsushi; Koseki, Toshinori; Suzuki, Sachio; Arimoto, Kenji; and Matsumoto, Koichi, 3,926,873.
Armco Steel Corporation: *See—*
Dunbar, Frank C.; and Oganowski, Kasimir, 3,926,572.
Melzer, Stephen F., 3,927,173.
Armitage, Bernard John: *See—*
Adams, Stuart Sanders; Armitage, Bernard John; Bristow, Norman William; and Heathcote, Bernard Vincent, 3,927,029.
Armour Pharmaceutical Company: *See—*
Hughes, John Lawrence; Seyler, Jay Kenneth; and Liu, Robert Chung-Huang, 3,926,938.
Jones, John L.; Rubino, Andrew M.; and Lindahl, Charles B., 3,927,188.
Arnold, Kurt, to Valcor Engineering Corporation. Solenoid operated proportional valve. 3,926,405, Cl. 251-129.000.
Aronson, Arthur H.; and Rarey, Charles R., to Jones & Laughlin Steel Corporation. Production of ferritic stainless steels containing zirconium. 3,926,624, Cl. 75-130.500.
Arthur, Jett C., Jr.: *See—*
Harris, James A.; and Arthur, Jett C., Jr., 3,926,550.
Reine, Alden H.; Arthur, Jett C., Jr.; and Portnoy, Norman A., 3,926,555.
Arthur, Jett Clinton: *See—*
Mares, Trinidad; and Arthur, Jett Clinton, 3,926,549.
Asada, Chiaki; and Watanabe, Toshiyuki, to Daido Seiko Kabushiki Kaisha. Cold workable and age-hardenable steel. 3,926,621, Cl. 75-124.000.
Asada, Mitsuo: *See—*
Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; Ishikawa, Hisao; Yamada, Shozo; Yasuda, Yasushi; and Asada, Mitsuo, 3,927,034.
Asahi Glass Company, Ltd.: *See—*
Takabatake, Mitsuo; and Tsuji, Kikuo, 3,927,223.
Asahi Kasei Kogyo Kabushika Kaisha: *See—*
Ohfuka, Toshio; Schichijo, Yoshihisa; Ichikawa, Yasushi; and Yamamoto, Katsuo, 3,926,930.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Aishima, Itsuho; Kitaoka, Atsushi; Koseki, Toshinori; Suzuki, Sachio; Arimoto, Kenji; and Matsumoto, Koichi, 3,926,873.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Moriyama, Itsuki; and Enomoto, Shigeo, 3,927,414.
Takahashi, Yasuo; and Oishi, Michiro, 3,926,503.

Asamura Patent Office: *See—*
Oki, Masami; Hori, Ryuzo; and Miwa, Naoto, 3,926,702.

Ashton, William B.: *See—*
Coleman, Richard L.; Cummins, Billy H.; and Ashton, William B., 3,926,786.

Atkinson, Lester M.; Bigham, Carroll R.; and Peed, James L., to United States of America, Air Force. Fatigue resistant splice. 3,925,956, Cl. 52-758.00D.

Atlantic Research Corporation: *See—*
Amundson, Robert M.; and Brown, Robert M., 3,927,260.
Brown, Robert M., 3,927,259.

Atlantic Richfield Company: *See—*
Duke, Spencer E.; and Stevens, Gerald L., 3,926,047.
Grane, Henry R.; and Zak, Thomas S., 3,927,120.
Grane, Henry R.; and Zak, Thomas S., 3,927,121.
Guetens, Edward G., 3,927,115.
Perkins, Thomas K., 3,926,259.
Whitehead, William F.; and Rogers, Ralph L., 3,927,168.

Attwood Corporation: *See—*
Wiggerman, Ronald E., 3,927,314.

Auborn, James J., to GTE Laboratories Incorporated. Electrochemical cells having an electrolytic solution comprising a covalent inorganic oxyhalide solvent. 3,926,669, Cl. 136-6.0LN.

Auer, Siegfried O.: *See—*
United States of America, National Aeronautics and Space Administration; and Auer, Siegfried O., 3,927,324.

Aufhauser, Alfred: *See—*
Irwin, Roy E.; and Aufhauser, Alfred, 3,926,776.

Augustin, Wilfried, to Jurid Werke GmbH. Friction elements running in oil. 3,927,241, Cl. 428-408.000.

Aumuller, Walter: *See—*
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Hitzel, Volker, 3,927,088.

Aurora Products Corporation: *See—*
Moe, Walter; and Meyers, Michael, 3,926,437.

Automation Development & Engineering Corporation: *See—*
Warning, Walter B., Sr., 3,926,105.

Autotronic Controls Corporation: *See—*
Merrick, James Walter, 3,926,165.

Avco Everett Research Laboratory, Inc.: *See—*
Locke, Edward V.; and Hella, Richard A., 3,926,510.

Avon Products, Inc.: *See—*
O'Neill, John J.; Komor, Joseph A.; Babcock, Thomas E.; Edmundson, Robert J.; and Shay, Edward G., 3,926,828.

Avon Rubber Company Limited: *See—*
Croft, Robert; and Lippiatt, Raymond, 3,927,158.

Azzarelli, Teodoro; Muntz, Eric P.; and Scott, Paul B., to Xonics, Inc. Electrode for electronradiography imaging chamber. 3,927,322, Cl. 250-315.000.

Babcock, Thomas E.: *See—*
O'Neill, John J.; Komor, Joseph A.; Babcock, Thomas E.; Edmundson, Robert J.; and Shay, Edward G., 3,926,828.

Babcock & Wilcox, Limited: *See—*
Schuster, Joachim; and Seien, Hermann, 3,927,295.

Babler, James H., to Research Corporation. Method of rearranging tertiary vinyl carbinols. 3,927,076, Cl. 260-488.00R.

Bach, Ricardo O.: *See—*
Hoffman, Doyt K.; and Bach, Ricardo O., 3,926,833.

Backstrom, Arne L., to Svenska Entreprenad AB Sentab. Method and reservoir for storing nuclear residues. 3,925,992, Cl. 61-.500.

Backx, Leo J. J.: *See—*
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 3,927,017.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Barzynski, Helmut; Marx, Matthias; Storck, Gerhard; and Saenger, Dietrich, 3,926,636.
Dimroth, Peter; Gaeng, Manfred; and Ruider, Guenther, 3,926,943.
Dimroth, Peter; and Radtke, Volker, 3,926,987.
Eisert, Manfred; and Schmeidl, Karl, 3,927,095.
Hagen, Helmut; and Fleig, Helmut, 3,926,966.

Baer, John S. Garment hanger. 3,926,351, Cl. 223-88.000.

Baer, Norman W.: *See—*
Sodal, Ingvar E.; Hoivik, Lars; Micco, Alexander J.; Weil, John V.; and Baer, Norman W., 3,926,209.

Bahr, Dennis E.: *See—*
Petzke, Jeffrey C.; and Bahr, Dennis E., 3,926,179.

Bailey, Denis M., to Sterling Drug Inc. 1(or 3) Perfluoroalkyl-3,4-dihydro-2(1H)-isoquinolinecarbonitriles and intermediates. 3,927,000, Cl. 260-283.00R.

Bailey, Denis M. 5-(3-Pyridyl)-2-furoic acid. 3,927,008, Cl. 260-295.50R.

Bailey, James R.; and Lavigne, Vernon W., to Switchcraft, Inc. Electrical connectors with interchangeable components. 3,926,499, Cl. 339-136.00R.

Baillie, William R., to Blue Ribbon Industries, Inc. Method for making wire protector. 3,926,030, Cl. 72-368.000.

Baines, Eric; Cropper, Edwin; and Forshaw, Sydney James, to Colgate-Palmolive Company. Dentifrices. 3,927,201, Cl. 424-54.000.

Baker, Richard W.; and Gale, Robert M., to Alza Corporation. Laminated drug dispenser. 3,926,188, Cl. 128-260.000.

Baker, Roy V., to United States of America, Agriculture. Spiral manometer. 3,926,057, Cl. 73-401.000.

Baklien, Asbjorn; and Kolm, Jan, to ICI Australia Limited. 2-Thiopseudoureas. 3,927,097, Cl. 260-564.00E.

Balabanov, Ivan Velev: *See—*
Pissarev, Angel Nikolaev; Miteva, Maria Pancheva; Balabanov, Ivan Velev; and Peychev, Lyubomir Dimov, 3,926,495.

Balinski, Henry A.; and Kuhr, Albert F., to United States Gypsum Company. Reticulated grating. 3,925,946, Cl. 52-180.000.

Balmford, David Ernest Hall: *See—*
Ciastula, Tadeusz Leopold; Rogers, Victor Alfred Baden; and Balmford, David Ernest Hall, 3,926,536.

Balzers Patent-und Beteiligungs-Aktiengesellschaft: *See—*
Pulker, Hans K., 3,927,228.

Bamberger, Carlos E.; and Richardson, Donald M., to United States of America, Energy Research and Development Administration. Chemical cycle for thermochemical production of hydrogen from water. 3,927,192, Cl. 423-648.000.

Barden, Allan D.: *See—*
Selvia, Ray E.; and Barden, Allan D., 3,926,342.

Bardwell, Francis G.; and Dudek, Edmund C., to Thor Power Tool Company. Control circuit for a power tool. 3,926,264, Cl. 173-12.000.

Bargiel, Joseph. Actuating device for a closure alarm mechanism. 3,926,140, Cl. 116-85.000.

Barlow, Charles Brian: *See—*
Tomlin, Clive Dudley Spencer; Barlow, Charles Brian; and White, Brian Graham, 3,926,611.

Baron, Richard C.; Cerankowski, Leon D.; and Mattucci, Neil, to Polaroid Corporation. Polyurethane elastomers prepared from diamine curing agents. 3,926,922, Cl. 260-77.5AM.

Baronnet, Rene: *See—*
Jonville, Pierre; Stohr, Helmut; Beccu, Klaus D.; and Baronnet, Rene, 3,926,674.

Barosi, Aldo, to S.A.E.S. Getters S.p.A. Gettering structure. 3,926,832, Cl. 252-181.600.

Barth, Wayne E., to Pfizer Inc. Method of preventing asthmatic symptoms. 3,927,214, Cl. 424-251.000.

Barth, Wayne E., to Pfizer Inc. Method of preventing asthmatic symptoms. 3,927,215, Cl. 424-251.000.

Bartlett, Morton P. Haystacker. 3,925,974, Cl. 56-346.000.

Bartley, George S.: *See—*
Licata, Joseph; Bartley, George S.; and Longenderfer, John E., 3,927,345.

Bartolini, Robert Alfred; and Bloom, Allen, to RCA Corporation. Permanent organic volume phase holographic recording medium. 3,926,637, Cl. 96-115.00R.

Barton, Derek Harold Richard; Underwood, William George Elphinstone; Looker, Brian Edgar; and Hewitt, Graham, to Glaxo Laboratories Limited. Certain 4,7-diaza-6-oxo-2-thiabicyclo[3,2,0]hept-3-enes. 3,927,013, Cl. 260-306.70C.

Bartran, David S.: *See—*
Chow, Ling George; and Bartran, David S., 3,927,397.

Barwick, William M. Air engine. 3,925,986, Cl. 60-398.000.

Barzynski, Helmut; Marx, Matthias; Storck, Gerhard; and Saenger, Dietrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Photocurable compositions. 3,926,636, Cl. 96-115.00R.

BASF Aktiengesellschaft: *See—*
Schuhmacher, Alfred, 3,926,996.

BASF Wyandotte Corporation: *See—*
Gallagher, James A.; and Brizgys, Bernardas, 3,927,053.

Bastenhof, Dirk, to Societe d'Etudes de Machines Thermiques. Method and device for stopping an internal combustion engine with fuel injection in case of overspeed. 3,926,163, Cl. 123-139.0AZ.

Bastian, Donald G., to SCM Corporation. Changeable type head. 3,926,294, Cl. 197-36.000.

Bates, Gregory A., to Procter & Gamble Company, The. Transfer and adherence of relatively dry paper web to a rotating cylindrical surface. 3,926,716, Cl. 162-113.000.

Batorewicz, Wadim, to Uniroyal, Inc. Compositions comprising mixtures of hydrogenphosphonates and methylphosphonates. 3,927,146, Cl. 260-921.000.

Battelle Development Corporation: *See—*
Fawcett, Sherwood L.; and Anno, James N., 3,927,329.

Battelle Memorial Institute: *See—*
Gutjahr, Manfred A.; Schmid, Rudolf; and Beccu, Klaus D., 3,926,671.
Jonville, Pierre; Stohr, Helmut; Beccu, Klaus D.; and Baronnet, Rene, 3,926,674.

Batterson, Norman D.: *See—*
Reeder, Wilbur C.; and Batterson, Norman D., 3,926,374.
Reeder, Wilbur C.; and Batterson, Norman D., 3,926,375.

Bauer, Jakob; and Krey, Winfried, to Varta Batterie AG. Primary magnesium element. 3,926,680, Cl. 136-154.000.

Bauer, Werner, to International Standard Electric Corporation. Voltage multiplier arrangement with capacitor rolls surrounded by diodes. 3,927,364, Cl. 321-15.000.

Bauser, Herbert; and Fischer, Dieter, to Braun Aktiengesellschaft. Device for generating electric sparks for igniting flammable vapors containing gas and air. 3,927,354, Cl. 317-81.000.

Bayer Aktiengesellschaft: *See—*
Colln, Reimer; and Hammann, Ingeborg, 3,926,998.
Enders, Edgar; and Stendel, Wilhelm, 3,927,217.
Ersfeld, Heinrich; Nadolski, Klaus; Schneider, Walter; Schulte, Klaus; and Boden, Heinrich, 3,926,219.
Esser, Heinz; and Boldt, Jurgen, 3,926,880.
Golitz, Hans Dietrich, deceased; Wagner, Kuno; Quiring, Bernd; and Noll, Walter, 3,927,042.
Harnisch, Horst, 3,927,005.
Holle, Bernd; and Winter, Gerhard, 3,926,660.

Huper, Fritz; and Rauenbusch, Erich, 3,926,730.
Lailach, Gunter; and Rademachers, Jakob, 3,926,615.
Mayer-Mader, Rudolf; and Gobel, Wilhelm, 3,926,912.
Nickel, Horst; and Schundehutte, Karl-Heinz, 3,926,546.
Straub, Otto Christian, 3,927,209.

Baylor, John M., to J.I. Case Company. Multi-cable laying blades or chutes. 3,926,004, Cl. 61-72.600.

Baylor, John M.: *See—*
Frisbee, Claude M.; and Baylor, John M., 3,926,263.

Bean, Lloyd, to Xerox Corporation. Circulation imaging method. 3,926,626, Cl. 96-1.00R.

Beard, William Q., Jr.; Moyer, Patricia H.; and Penner, Siegfried E., to Vulcan Materials Company. Catalysts comprising a metal halide salt on an interstratified synthetic aluminosilicate carrier and chlorination processes, etc. 3,926,847, Cl. 252-441.000.

Beaumont, Peter W. Hand tool. 3,925,871, Cl. 29-239.000.

Beccu, Klaus D.: *See—*
Gutjahr, Manfred A.; Schmid, Rudolf; and Beccu, Klaus D., 3,926,671.
Jonville, Pierre; Stohr, Helmut; Beccu, Klaus D.; and Baronnet, Rene, 3,926,674.

Becher, Jan; and Ullman, Edwin F., to Synvar Associates. 1-Oxylimidazolinyl compounds used as stable free radical pH indicators. 3,927,019, Cl. 260-309.600.

Becht, Carl T., to Senco Products, Inc. Staple for light gauge metal piercing. 3,925,955, Cl. 52-758.00D.

Bechtel, Jon Harold, to Johnson Service Company. Relative humidity computer. 3,926,052, Cl. 73-336.500.

Beck, Gerhard; and Zeininger, Siegfried, to Eltro GmbH Gesellschaft fur Strahlungstechnik. Reflector antenna with focusing spherical lens. 3,927,407, Cl. 343-754.000.

Beck, Herman D.; and Cook, Thomas H., to Owens-Illinois, Inc. Telescopic container members. 3,926,362, Cl. 229-23.0BT.

Beck, Louis: *See—*
Kelley, Zar W., 3,925,988.

Becker, Kunibert: *See—*
Harmsma, Guenter; Rosenberg, Harry; Laabs, Johannes; and Becker, Kunibert, 3,925,995.

Beckman Instruments, Inc.: *See—*
Stephens, Donald E., 3,926,800.

Beecham Group Limited: *See—*
Burton, George; Davies, John Sydney; and Hubbard, Ann Frances, 3,926,955.
Callander, Sidney Edward, 3,926,958.
Ferres, Harry; Kemmenoe, Adrian Victor; and Best, Desmond John, 3,926,960.

Beermann, Claus: *See—*
Reuter, Martin; and Beermann, Claus, 3,927,112.

Beets, Muus G. J.: *See—*
Hall, John B.; Lala, Lekhu Kewalram; Beets, Muus G. J.; and Taylor, William I., 3,927,083.

Beggs, Donald; and Ahrendt, William A., to Midrex Corporation. Passivation of metallized pellets in bulk. 3,926,617, Cl. 75-.5BA.

Beijer, Louis Benjamin; Driessen, Antonius Jozephus Gerardus Cornelis; and Jacobs, Cornelis Adrianus Joannes, to U. S. Philips Corporation. Wall-stabilised high-pressure mercury vapour discharge lamp containing iodide. 3,927,343, Cl. 313-214.000.

Belden Corporation: *See—*
Timmons, Frank E., 3,927,247.

Bell Helmets Inc.: *See—*
Lewicki, Lester R., 3,925,821.

Bell & Howell Company: *See—*
Costanza, Carl C.; Weber, Walter W.; Betlejewski, Frank W.; and Frystak, Richard, 3,926,514.
Fleischman, Andor A., 3,926,504.
Sund, Joseph Tat-Hin, 3,927,237.

Bell, Oliver A., Jr., to Colt Industries Operating Corporation. Function control circuit for EDM power supply. 3,927,293, Cl. 219-69.00C.

Bell, Ralph E. Fireplace structure. 3,926,174, Cl. 126-121.000.

Bell Telephone Laboratories, Incorporated: *See—*
Caron, Lionel, 3,927,392.
Copenhafer, Dennis Lee, 3,927,257.
Cox, Donald Clyde; Langseth, Rollin Edward; Reudink, Douglas Otto John; and Rustako, Anthony Joseph, Jr., 3,927,379.
DiMarcello, Frank Vincent, 3,927,238.
Jaeger, Raymond Edward; and Miller, Thomas John, 3,927,155.
Newby, Kenneth Russ; and Winters, Earl Dallas, 3,926,747.

Belliveau, Ronald L.: *See—*
Saari, George W.; and Belliveau, Ronald L., 3,925,960.

Beloit Corporation: *See—*
Chance, James L.; and Han, Shu Tang, 3,925,906.

Benczur-Urmossy, Gabor, to Deutsche Automobilgesellschaft mbH. Catalysts for the cathodic hydrogen development. 3,926,844, Cl. 252-432.000.

Bendix Corporation, The: *See—*
Haase, Elmer A.; and Kirwin, James M., 3,926,162.
McCombs, Howard L., 3,925,980.
Meyers, Robert E., 3,926,092.
Reddy, Junuthula N., 3,926,153.
Sollami, Blase J., 3,926,011.
Wertheimer, Harry P., 3,926,161.

Benerito, Ruth R.: *See—*
Ward, Truman L.; Benerito, Ruth R.; and Hebert, Jacques J., 3,926,709.

Benjamin, John Stanwood; and Schultz, Jay Ward, to International Nickel Company, Inc., The. High strength corrosion resistant nickel-base alloy. 3,926,568, Cl. 29-182.500.

Benson, Louis. Multi-positionable bottle closure for selective safety or general use. 3,926,325, Cl. 215-206.000.

Bentz, Francis: *See—*
Saleck, Wilhelm; Engelhard, Helmut; Himmelmann, Wolfgang; Bentz, Francis; and Mader, Helmut, 3,926,635.

Benvenuti, Franco: *See—*
Neri, Paolo; Antoni, Guido; and Benvenuti, Franco, 3,927,204.

Benziger, Theodore M.: *See—*
Coburn, Michael D.; and Benziger, Theodore M., 3,926,953.

Berendsen, Jules Robert: *See—*
Hofman, Emiel Alexander; Berendsen, Jules Robert; and Pollet, Robert Joseph, 3,926,632.

Beretta, Oscar, to Technifil S.A. Gravity catch for hinged guard fences. 3,926,412, Cl. 256-46.000.

Berger, Raymond D. Snake venom milker. 3,926,149, Cl. 119-1.000.

Bergwerksverband GmbH: *See—*
Schmalfeld, Paul; Sauter, Dieter; Peters, Werner; Ahland, Erwin; Bock, Burkhard; and Lehmann, Joachim, 3,926,576.

Berkowitz, Sidney: *See—*
Meadow, Morton; and Berkowitz, Sidney, 3,927,185.

Bermanseder, Norbert: *See—*
Bermanseder, Robert; and Bermanseder, Norbert, 3,926,100.

Bermanseder, Robert; and Bermanseder, Norbert, to Daimler-Benz AG. Bus. 3,926,100, Cl. 98-2.140.

Bermas, Gunnar Valfrid, to U. S. Philips Corporation. Exchange mechanism for film plates in an X-ray recording or displaying apparatus. 3,927,327, Cl. 250-470.000.

Bernard, James A., to General Motors Corporation. Add-on clothes hanger for appliance. 3,926,315, Cl. 211-102.000.

Bernhard, Horst; Esselborn, Reiner; Hesse, Reiner; and Russmann, Horst, to Merck Patent Gesellschaft mit beschraenkter Haftung. Iron-containing mica flake pigments. 3,926,659, Cl. 106-291.000.

Bernhardt, Helmut: *See—*
Deusing, Erich; Bernhardt, Helmut; and Durth, Wilfried, 3,926,106.

Berrie, Alistair Howard; and Budziarek, Richard, to Imperial Chemical Industries Limited. Water-soluble cellulose reactive azo dyestuffs containing 3-azo-2-hydroxy-N-subnstituted pyrid-6-one radical. 3,926,944, Cl. 260-153.000.

Berry, Peter J.; and Maguire, Gerald J., to Xerox Corporation. Optical scanning system. 3,926,518, Cl. 355-8.000.

Bertellotti, Ansano, to GTE Automatic Electric Laboratories Incorporated. Locking bar for printed wiring card file. 3,926,490, Cl. 312-319.000.

Berthold, Erich: *See—*
Kurth, Harald; Laube, Dieter; and Berthold, Erich, 3,926,013.

Berthold, Frank: *See—*
Plesslinger, Gertraud Agnes Anna; Berthold, Frank; and Roeder, Erwin, 3,926,603.

Bertioli, Michael Murray: *See—*
Wentworth, Philip Rossell; and Bertioli, Michael Murray, 3,927,304.

Bertsch, Erich, to Lonza Ltd., Gampel/Valais. Column device. 3,926,741, Cl. 202-269.000.

Best, Desmond John: *See—*
Ferres, Harry; Kemmenoe, Adrian Victor; and Best, Desmond John, 3,926,960.

Bethlehem Steel Corporation: *See—*
Tarhan, Mehmet Orhan, 3,927,153.

Betlejewski, Frank W.: *See—*
Costanza, Carl C.; Weber, Walter W.; Betlejewski, Frank W.; and Frystak, Richard, 3,926,514.

Bettcher Industries, Inc.: *See—*
Bettcher, Louis A., 3,926,080.

Bettcher, Louis A., to Bettcher Industries, Inc. Apparatus for and method of processing meat products. 3,926,080, Cl. 83-15.000.

Bevans, Douglas L. Plastic hose clamp. 3,925,851, Cl. 24-20.0TT.

Bianchi, Giuseppe: *See—*
De Nora, Oronzio; Bianchi, Giuseppe; Nidola, Antonio; and Trisoglio, Giovanni, 3,926,751.

Bianchi, Thomas A., to Eastman Kodak Company. Substituted styrenes. 3,927,117, Cl. 260-613.00D.

Bicron Corporation: *See—*
Spurney, Richard W., 3,926,566.

Bieber, Rolf: *See—*
Wunning, Joachim; Bieber, Rolf; and Lustig, Heinz, 3,926,038.

Biermann, Arnold E. Constant velocity universal joints. 3,926,012, Cl. 64-19.000.

Biethan, Uwe: *See—*
Feldman, Rainer; Biethan, Uwe; Muller, Karl Adolf; and Panoch, Hans Joachim, 3,927,141.

Bigham, Carroll R.: *See—*
Atkinson, Lester M.; Bigham, Carroll R.; and Peed, James L., 3,925,956.

Billeter, Thomas R.; and Philipp, Lee D., to Westinghouse Electric Corporation. Microwave frequency sensor utilizing a single resonant cavity to provide simultaneous measurements of a plurality of physical properties. 3,927,369, Cl. 324-58.50C.

Binette, Andre. Manhole. 3,926,533, Cl. 404-26.000.

Binz & Co.: *See—*
Grunenwald, Karl, 3,926,099.

Biricz, Stefan: *See—*
Dub, Karl; and Biricz, Stefan, 3,926,346.

Birkenfeld, Richard; and Wieligmann, Friedrich, to E. Mollers, Maschinenfabrik, Firma. Arrangement for pulling a tube of heat-shrinkable plastic downwardly over a stack of goods. 3,925,964, Cl. 53-183.000.

Birthwright, Robert Geoffrey. Control apparatus. 3,927,387, Cl. 338-317.000.

Birtigh, Gerhard; Parbel, Horst; and Sauer, Heinrich, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Apparatus for cleaning exhaust gases. 3,926,565, Cl. 23-288.0FC.

Bissell, Sherman M.; De Vlieg, Garrett H.; and Hopland, Johan N., to Boeing Company, The. Aircraft automatic braking system having auto-brake control logic. 3,926,479, Cl. 303-21.0AF.

Bizilia, Paul K., to Ingersoll-Rand Company. Signal valve. 3,926,212, Cl. 137-495.000.

Bjelland, Ronald W.; Narwicz, Charles A.; and Hetmanski, Casimir, to United States Lines, Inc. Lining of containers for bulk cargo. 3,926,331, Cl. 220-63.00R.

Black, Robin Michael: *See—*
White, Alan Chapman; and Black, Robin Michael, 3,926,994.

Blair Manufacturing Company: *See—*
Ryan, Kelly P., 3,926,378.

Blanchard, James S.; and Weaver, Robert F., to P.R. Mallory & Co. Inc. Clutch for gear trains. 3,926,067, Cl. 74-461.000.

Blank, Artur: *See—*
Crovetti, Aldo Joseph; Blank, Artur; and Germann, Richard Paul, 3,927,100.

Blank, Izhak; and Fertig, Joseph, to Hydrophilics International, Inc. Copolymer containing medicaments. 3,927,206, Cl. 424-81.000.

Blatt, Leland F. Rotating detented push-pull plunger clamp. 3,926,418, Cl. 269-13.000.

Blazer, Cedric W., to Zenith Cutter Company. Knife holding apparatus. 3,926,084, Cl. 83-698.000.

Blebea, Speranta: *See—*
Constantinescu, Petre; Hristea, Nicolae; Blebea, Speranta; Hristea, Ieronim; Huniadi, Mihai; and Gabureanu, Mircea, 3,925,928.

Bleier, Waldemar; and Gremmelspacher, Max, to Bleier, Waldemar. Clip, clamping jaw and assembly for the interruption of the urogenital system. 3,926,195, Cl. 128-346.000.

Blocked Iron Corporation: *See—*
Imperato, Louis George, Jr., 3,926,616.

Bloemhof, Jan. Product bagging machine. 3,925,967, Cl. 53-385.000.

Blomstrom, Gary D.; Randour, Victor; and York, Lyle E., to Caterpillar Tractor Co. Track mounting arrangement having dual gauge settings. 3,926,273, Cl. 180-9.480.

Blondin, Eric: *See—*
Marrast, Jacques; Minssieux, Louis; and Blondin, Eric, 3,926,257.

Bloom, Allen: *See—*
Bartolini, Robert Alfred; and Bloom, Allen, 3,926,637.

Bloxham, Glen Lee; and Wells, Don Charles, to American Telephone and Telegraph Co. Automatic circuit for providing emergency ground start signals on PBX trunks. 3,927,272, Cl. 179-18.0AD.

BLS Associates: *See—*
Brooks, Cecil M., 3,926,529.

Blue Ribbon Industries, Inc.: *See—*
Baillie, William R., 3,926,030.

Board, Richard G.; and Shapiro, Nelson H. Retractable safety belts. 3,926,385, Cl. 242-107.400.

Bobst Champlain, Inc.: *See—*
Bonnell, George N., 3,926,355.
Santa Maria, Richard C.; and Anastasio, Frank J., 3,926,097.

Bock, Burkhard: *See—*
Schmalfeld, Paul; Sauter, Dieter; Peters, Werner; Ahland, Erwin; Bock, Burkhard; and Lehmann, Joachim, 3,926,576.

Bockman, Ole Kristian, to Aktiebolaget Svenska Flaktfabriken. Dust filter apparatus. 3,926,595, Cl. 55-302.000.

Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V., to Owens-Illinois, Inc. Capillary tube gas discharge device. 3,927,342, Cl. 313-188.000.

Boden, Heinrich: *See—*
Ersfeld, Heinrich; Nadolski, Klaus; Schneider, Walter; Schulte, Klaus; and Boden, Heinrich, 3,926,219.

Bodnar, Janos: *See—*
Korbonits, Dezso; Harsanyi, Kalman; Molnar nee Bako, Erzsebet; Takacs, Kalman; Heja, Gergely; Bodnar, Janos; Bodrogi, Istvan; and Erodi, Judit, 3,927,025.

Bodrogi, Istvan: *See—*
Korbonits, Dezso; Harsanyi, Kalman; Molnar nee Bako, Erzsebet; Takacs, Kalman; Heja, Gergely; Bodnar, Janos; Bodrogi, Istvan; and Erodi, Judit, 3,927,025.

Boeing Company, The: *See—*
Bissell, Sherman M.; De Vlieg, Garrett H.; and Hopland, Johan N., 3,926,479.

Bogdanova, Nadezhda Sergeevna: *See—*
Grinev, Alexei Nikolaevich; Shvedov, Vasily Ivanovich; Sytina, Evgenia Nikolaevna; Bogdanova, Nadezhda Sergeevna; Nikolaeva, Irina Sergeevna; Pershin, Grigory Nikolaevich; and Guskova, Tatyana Anatolievna, 3,927,125.

Bogomolov, Igor Vasilievich: *See—*
Orlov, Petr Nikolaevich; Nesterov, Jury Ivanovich; Kudashov, Vasily Yakovlevich; Zimnyakov, Alexandr Vasilievich; Ermakova, Irina Nikolaevna; Bogomolov, Igor Vasilievich; Nirman, Efim Matveevich; and Sokolov, Vladimir Dmitrievich, 3,925,936.

Bohm, Walter. Printing machine. 3,926,111, Cl. 101-116.000.

Boldt, Jurgen: *See—*
Esser, Heinz; and Boldt, Jurgen, 3,926,880.

Bolduan, Dieter: *See—*
Markewitz, Wolfgang; and Bolduan, Dieter, 3,926,403.

Bolhofer, William A., to Merck & Co., Inc. Amides of 2-[halophenoxy (or halophenylthio)]-alkanoic acids. 3,927,092, Cl. 260-559.00B.

Boller, Arthur; and Scherrer, Hanspeter, to Hoffmann-La Roche Inc. Benzylidene-aminobenzonitriles. 3,927,064, Cl. 260-465.00E.

Boller, Arthur: *See—*
Scherrer, Hanspeter; and Boller, Arthur, 3,927,066.

Bombardier Limited: *See—*
Lippitsch, Hans Heinz, 3,926,157.

Bond, James W.; and Speiser, Jeffrey M., to United States of America, Navy. Complex filters, convolvers, and multipliers. 3,926,367, Cl. 235-181.000.

Bondy, Harry L.: *See—*
Lowe, William F.; and Bondy, Harry L., 3,926,713.

Bonnell, George N., to Bobst Champlain, Inc. Apparatus for intermittently feeding lengths of continuous sheet material at a constant velocity. 3,926,355, Cl. 226-114.000.

Boots Company Limited, The: *See—*
Adams, Stuart Sanders; Armitage, Bernard John; Bristow, Norman William; and Heathcote, Bernard Vincent, 3,927,029.

Boozalis, Theodore S.: *See—*
Willis, Gordon G.; Ivy, John B.; Boozalis, Theodore S.; and Cragar, Darryl E., 3,927,132.

Boozer, Charles E., to Copolymer Rubber & Chemical Corporation. Preparation of sulfur vulcanizable oil extended elastomeric material and vulcanizates therefrom. 3,926,901, Cl. 260-33.6AQ.

Borden, Inc.: *See—*
Duchesneau, Eugene A., Jr.; and Boudreau, Donald F., 3,926,889.

Borg-Warner Corporation: *See—*
Albertson, Clarence E.; and Krueger, Robert H., 3,926,818.
Guzy, Raymond L.; and Sheth, Rajesh N., 3,926,900.

Borgman, Milton H.: *See—*
Trifunovic, Alexander L.; Hills, William H.; Borgman, Milton H.; and Mersereau, Emory P., 3,925,976.

Bornhorst, Walter J.; Coleman, Steven J.; and O'Brien, James W., to Thermo Electron Cosporation. Airway. 3,926,196, Cl. 128-351.000.

Borror, Alan L.; Hill, Ruth Linda; and Garcia, Paulina P., to Polaroid Corporation. Novel chemical synthesis. 3,926,971, Cl. 260-240.600.

Borysiewicz, Richard: *See—*
Roedel, Charles W.; and Borysiewicz, Richard, 3,927,265.

Bost, Howard W. Emergency eye wash fountain apparatus. 3,925,829, Cl. 4-166.000.

Bouchaudon, Jean; Le Roy, Pierre; and Messer, Mayer Naoum, to Rhone-Poulenc, S.A. Process for the preparation of ampicillin. 3,926,956, Cl. 260-239.100.

Boucher, Raymond Marcel Gut. Biocidal electromagnetic synergistic process. 3,926,556, Cl. 21-54.00R.

Boudreau, Donald F.: *See—*
Duchesneau, Eugene A., Jr.; and Boudreau, Donald F., 3,926,889.

Bourdin, Francois; Chizat, Francois; Costantini, Michel; and Jouffret, Michel, to Rhone-Poulenc S.A. Process for the preparation of alkylphenols. 3,927,122, Cl. 260-621.00G.

Bourdin, Francois; Chizat, Francois; Costantini, Michel; and Jouffret, Michel, to Rhone-Poulenc S.A. Process for the preparation of alkylphenols. 3,927,123, Cl. 260-621.00G.

Bouyoucos, John V., to Hydroacoustics, Inc. Drill steel for percussive drilling devices. 3,926,265, Cl. 173-80.000.

Bowcott, Roy Price, to Lucas Electrical Company Limited, The. Method of making a face commutator. 3,925,881, Cl. 29-597.000.

Bowen, Stephen T., to Dart Industries, Inc. Crosslinkable thermoplastic compositions and processes therefor. 3,926,902, Cl. 260-40.00R.

Bowen Tools, Inc.: *See—*
Slator, Damon T., 3,926,260.

Bower, James C. Test apparatus for high pressure container. 3,926,036, Cl. 73-37.000.

Bowers, Russell E.: *See—*
McInnes, Robert, 3,926,666.

Bowman, Harry P.: *See—*
McInnes, Robert, 3,926,666.

Bozer, Keith B.; and Brown, Lloyd H., to Quaker Oats Company, The. Method of fabrication of furan resin bonded fiber reinforced articles by spray-up technique. 3,927,139, Cl. 260-829.000.

Bozsanyi, William G. Hair clipper for the nose and ears. 3,925,888, Cl. 30-29.500.

BP Chemicals International Limited: *See—*
Fogg, Sidney George; King, Peter Graham; and Yeoman, Elfed, 3,926,877.

Brach, Paul J.; and Six, Hugh A., to Xerox Corporation. Process of making X-form metal phthalocyanine. 3,927,026, Cl. 260-314.500.

Braden, Ralph S.; Pugh, Cecil C.; and Rigg, Ralph R., to General Motors Corporation. Ice level sensing arm retractor. 3,926,007, Cl. 62-137.000.

Bradley, Frank R. Instrument for measuring harmonic distortion in telephone transmission. 3,927,281, Cl. 179-175.30R.

Bradley, John J.; and Nystrand, Ernst Daniel, to Paper Converting Machine Company. Method for storage of wound rolls of paper. 3,926,299, Cl. 198-20.00R.

Bradley, Ronnie A.; Miller, William H.; and Sease, John D., to United States of America, Energy Research and Development Administration. Volumetric dispenser for small particles from plural sources. 3,926,344, Cl. 222-145.000.

Brandenburg, John T.: *See—*
Wilson, Raymond F.; Peck, Reese A.; Estes, John H.; and Brandenburg, John T., 3,926,779.

Braun Aktiengesellschaft: *See—*
Bauser, Herbert; and Fischer, Dieter, 3,927,354.

Brendling, Lennart. Container. 3,926,233, Cl. 150-2.500.

Brendlinger, Edward C.; Higgs, Richard F.; and Kharouf, Issa J., to United States Steel Corporation. Electrolytic treating apparatus. 3,926,767, Cl. 204-206.000.

Breslow, David S.; and Simpson, David A., to Hercules Incorporated. Photopolymer lithographic plate element. 3,926,642, Cl. 96-115.00R.

Breslow, Jeffrey D.; and Kaelin, Bette M., to Marvin Glass & Associates. Board game apparatus utilizing two chance devices. 3,926,438, Cl. 273-134.00C.

Brett, Thomas J., Jr.: *See—*
Cantor, Stephen E.; and Brett, Thomas J., Jr., 3,927,067.

Breuer, Hermann, to E. R. Squibb & Sons, Inc. Acylthiomethyl esters of cephalosporins. 3,926,985, Cl. 260-243.00C.

Breuer, Hermann: *See—*
Treuner, Uwe D.; and Breuer, Hermann, 3,926,979.
Treuner, Uwe D.; and Breuer, Hermann, 3,926,980.
Treuner, Uwe D.; and Breuer, Hermann, 3,926,983.

Brewer, Howell K.: *See—*
Petersons, Aivars V.; and Brewer, Howell K., 3,926,239.

Brewster, Roger F., to General Motors Corporation. Rectifier circuit for providing six-phase rectification of three-phase alternating current. 3,927,362, Cl. 321-5.000.

Breyer, Frederick; Davis, George T.; and Krusche, Edwin C., to Hollymatic Corporation. Apparatus for distributing particles. 3,926,146, Cl. 118-24.000.

Bridgestone Tire Company Limited: *See—*
Hayashi, Noriyuki; Sasaki, Kenji; Inaba, Hideaki; and Nonaka, Koushi, 3,927,144.

Brill, Richard Henry: *See—*
Eaton, John Littell, Jr.; Brill, Richard Henry; and Myers, Walter E., 3,926,333.

Brinly-Hardy Co., Inc.: *See—*
Doering, Charles W., 3,926,108.

Bristow, Norman William: *See—*
Adams, Stuart Sanders; Armitage, Bernard John; Bristow, Norman William; and Heathcote, Bernard Vincent, 3,927,029.

Britain, Cecil E., to Britain, Muriel M.; Dickinson, Charles F.; Dickinson, Ryta M.; and Bump, Norva M. Liquid plastic repair composition and method. 3,926,895, Cl. 260-30.40R.

Britain, Muriel M.: *See—*
Britain, Cecil E., 3,926,895.

British Broadcasting Corporation: *See—*
Rainger, Peter, 3,927,250.

Brizgys, Bernardas: *See—*
Gallagher, James A.; and Brizgys, Bernardas, 3,927,053.

Broadway, Alexander Richard William; Fong, William; and Rawcliffe, Gordon Hindle, to National Research Development Corporation. Electric motors. 3,927,358, Cl. 318-224.000.

Brocklehurst, Charles E., to Riegel Textile Corporation. Counting and segregating mechanism for individual articles. 3,926,334, Cl. 221-7.000.

Brodsky, Harvey A.: *See—*
Fish, Leonard A.; Brodsky, Harvey A.; and Weitzel, Bruce A., 3,927,264.

Broms, Bengt; and Wager, Oleg, to AB Fodervavnader. System of armouring earth. 3,925,994, Cl. 61-39.000.

Brook, Richard J.: *See—*
Whelan, James M.; and Brook, Richard J., 3,926,854.

Brooks, Cecil M., to BLS Associates. Selectively repositionable fastener. 3,926,529, Cl. 403-4.000.

Brooks, Leon E.; and White, James T., to Cap-Con International, Inc. Method and apparatus of freezing a plug in a pipe for pressure testing. 3,926,006, Cl. 62-66.000.

Brooks, Merle H. Piggyback mogul grader. 3,926,262, Cl. 172-780.000.

Brooks, Wayne D.; and Hendricks, Thomas L., to Magna Machine & Tool Co. Shuttle loader for press. 3,926,032, Cl. 72-419.000.

Brotzmann, Karl: *See—*
Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans-Georg, 3,926,618.

Brown Brothers Engineering Limited: *See—*
Hunwicks, Alec Alfred, 3,926,397.

Brown, Charles D.: *See—*
Teuber, Roland E.; Pearson, John L.; and Brown, Charles D., 3,926,390.

Brown, Edward L.: *See—*
Stary, Marvin L.; Brown, Edward L.; and Pridonoff, Eric L., 3,926,230.

Brown, Francis E.: *See—*
Lasswell, Joseph A.; and Brown, Francis E., 3,926,934.

Brown, Lloyd H.: *See—*
Bozer, Keith B.; and Brown, Lloyd H., 3,927,139.

Brown, Neil L., to United States of America, Navy. Conductivity, temperature and pressure measuring system. 3,926,056, Cl. 73-398.0AR.

Brown, Richard E.; and Shavel, John, Jr., to Warner-Lambert Company. Imidazolyl benzofurans. 3,927,023, Cl. 260-309.600.

Brown, Robert M., to Atlantic Research Corporation. Signal identification system. 3,927,259, Cl. 179-1.0MN.

Brown, Robert M.: *See—*
Amundson, Robert M.; and Brown, Robert M., 3,927,260.

Bruckner Apparatebau GmbH: *See—*
Schuierer, Manfred, 3,926,554.

Bruckner, Kurt. Wet treatment process for textiles. 3,926,552, Cl. 8-155.100.

Bruder, Joseph Albert, to Calspan Corporation. Method and apparatus for off-boresight angle correction for monopulse radars with slow agc normalization. 3,927,406, Cl. 343-16.00M.

Bruderer, Werner: *See—*
Meier, Walter; Zeller, Josef; Koenig, Peter J.; Bruderer, Werner; and Schmid, Markus, 3,926,244.

Brunie, Jean-Claude; and Crenne, Noel, to Rhone-Poulenc S.A. Process for the preparation of mixtures of cycloalkanols and cycloalkanones. 3,927,105, Cl. 260-586.00P.

Brut, Gerard Yvan: *See—*
Humbert, Jean Jacques; Thomas, Jean Pierre Francis; Brut, Gerard Yvan; and Gounou, Jean Marie Joseph Elie, 3,926,697.

Bryson, Jay G., to Goodyear Tire & Rubber Company, The. Method of preparing nonconjugated diolefins. 3,927,137, Cl. 260-680.00B.

Buchschacher, Paul: *See—*
Furst, Andor; Buchschacher, Paul; Kagi, Dieter; Meier, Werner; Muller, Marcel; and Widmer, Erich, 3,927,032.

Buck, Sheldon W., to Charles Stark Draper Laboratory, Inc., The. Gravity gradiometer. 3,926,054, Cl. 73-382.000.

Buckley, Donald J., Sr.: *See—*
Makowski, Henry S.; and Buckley, Donald J., Sr., 3,927,143.

Bucolo, Giovanni, to Calbiochem. Enzymatic ethanol assay. 3,926,736, Cl. 195-103.50R.

Budziarek, Richard: *See—*
Berrie, Alistair Howard; and Budziarek, Richard, 3,926,944.

Budzinski, Roger R.: *See—*
Konas, William W.; Day, Paul L.; and Budzinski, Roger R., 3,926,415.

Buford, J. Philip, to Recon Corporation. Apparatus and method for automatically separating magnetic from non-magnetic substances. 3,926,792, Cl. 209-215.000.

Bump, Norva M.: *See—*
Britain, Cecil E., 3,926,895.

Bunker, James W., to Hi-Shear Corporation. Separation nut. 3,926,090, Cl. 85-33.000.

Bunker Ramo Corporaation: *See—*
Occhipinti, Carl, 3,926,496.

Bunker Ramo Corporation: *See—*
Hoppe, Paul Peter, Jr., 3,926,498.

Bunnell, Lee Roy: *See—*
Hungate, Frank Porter; Riemath, William Frederic; and Bunnell, Lee Roy, 3,927,325.

Burch, Darrell E.: *See—*
Pembrook, John D.; Burch, Darrell E.; and Gates, Francis J., 3,926,527.

Burger Eisenwerke Aktiengesellschaft: *See—*
Deusing, Erich; Bernhardt, Helmut; and Durth, Wilfried, 3,926,106.

Burgers, August, to Europatent S.A. Door frame. 3,925,934, Cl. 49-504.000.

Burgess, Kenneth G., to Hydrospace Industries, Inc. Silver recovery system. 3,926,768, Cl. 204-229.000.

Burke, William F.; Crowell, Lee T.; Greenwood, Robert C.; and Jones, Thomas E., to Pan-Nova, Inc. Coded token and acceptor. 3,926,291, Cl. 194-4.00F.

Burkholder, Ward J., to Goodyear Tire and Rubber Company, The. Process for the neutralization of alkyl aromatic hydroperoxide rearrangement reaction products. 3,927,124, Cl. 260-621.00A.

Burns, Kenneth S.; Ferment, George R.; and Waugh, Roger C., to Cellanese Corporation. Carbonaceous tapes. 3,926,228, Cl. 139-420.00R.

Burns, Ronald N.; Landwehr, Dewayne A.; Schroeder, Roger H.; Vogelei, Robert A.; and Zeller, Gary P., to General Motors Corporation. Shock absorbing buffer assembly. 3,926,462, Cl. 293-63.000.

Burroughs Corporation: *See—*
Moister, Douglas E., Jr., 3,926,360.

Burton, George; Davies, John Sydney; and Hubbard, Ann Frances, to Beecham Group Limited. Carbenicillin analogues. 3,926,955, Cl. 260-239.100.

Burton, Parsons & Company, Inc.: *See—*
Holcombe, Frank O., Jr., 3,926,892.

Bush, John B., Jr.: *See—*
Finkbeiner, Herman L.; and Bush, John B., Jr., 3,927,077.

Busso, Giuseppe, to Alfa Romeo S.p.A. Rack-and-pinion steering gear box incorporating a damper for motor vehicles. 3,926,070, Cl. 74-498.000.

Butti, Adriano; and Prino, Giuseppe, to Crinos Industria Farmacobiologica SpA. Pharmaceutical compositions comprising mixed salts of sulfoglycopeptides with metal and organic bases. 3,926,921, Cl. 424-177.000.

C. Conradty, Firma: *See—*
Koziol, Konrad; Rathjen, Hans-Carl; and Sieberer, Karl-Heinz, 3,926,773.

C. Evans & Sons Limited: *See—*
Gostling, Peter Eric, 3,926,531.

C-G Process Coal Company: *See—*
Gay, Larry T., 3,926,787.

C. Hager & Sons Hinge Manufacturing Company: *See—*
Peterson, Francis C., 3,926,460.

C. L. Frost & Son, Inc.: *See—*
Frost, Charles C.; and Weis, Siegfried K., 3,926,485.

c/o E. I. Du Pont de Nemours & Co.: *See—*
Matrisian, Robert Michael, 3,926,357.

Cadotte, John E., to United States of America, Interior. Reverse osmosis membrane. 3,926,798, Cl. 210-23.000.

Cahen, Raymond M.; Debus, Henri R.; and Andre, Jacques M. J. G., to Labofina S. A. Oxidation catalysts. 3,926,852, Cl. 252-456.000.

Cake, Arthur F.: *See—*
Carlson, Paul A.; and Cake, Arthur F., 3,927,336.

Calame, Jean-Pierre: *See—*
Lamparsky, Dietmar; and Calame, Jean-Pierre, 3,926,859.

Calbiochem: *See—*
Bucolo, Giovanni, 3,926,736.

Calgon Corporation: *See—*
Guilbault, Lawrence James; and Zakrzewski, James Richard, 3,926,718.

Caliendo, Joseph L. Rotary toothbrush. 3,925,841, Cl. 15-23.000.

California Institute of Technology: *See—*
Rembaum, Alan; and Yen, Shiao-Ping Siao, 3,927,242.

Callahan, John, to Electronic Arrays, Inc. MOSFET bistrap buffer. 3,927,334, Cl. 307-269.000.

Callander, Sidney Edward, to Beecham Group Limited. Preparation of penicillin salts. 3,926,958, Cl. 260-239.100.

Callies, Dieter; Frank, Gunter; and Graf vom Hagen, Siegbert, to Kyberna GmbH. Ignition device for internal combustion engines. 3,926,557, Cl. 123-148.00E.

Calspan Corporation: *See—*
Bruder, Joseph Albert, 3,927,406.

Cam Gears Limited: *See—*
Sloane, Clifford, 3,926,091.

Cameron Iron Works, Inc.: *See—*
Williams, Leonard E., Jr.; and Aiken, William B., 3,926,457.

Camp, Lionel S., to Woods, M. Bruce; and Renfro, Julian C., part interest to each. Starting circuit for engine utilizing fuel injection pump. 3,926,167, Cl. 123-179.00L.

Campanella, Samuel Joseph: *See—*
Sciulli, Joseph A.; Campanella, Samuel Joseph; and Costales, Rene, 3,927,268.

Canada, Her Majesty, The Queen, in Right of, as represented by the Minister of Nat. Defence: *See—*
Marchessault, Robert H.; and Fisa, Bohuslav, 3,926,717.

Canadian Industries Limited: *See—*
Archambault, Jacques Olivier; and McIrvine, John Douglas, 3,927,191.

Canadian Patents and Development Limited: *See—*
Chapman, George D., 3,926,523.
Dimyan, Magid Y., 3,927,398.

Cannon, Thomas C., Jr., to Cannon, Thomas C., Jr.; and Coy, Brent E. Remote controlled vehicle systems. 3,926,434, Cl. 273-86.00B.

Cantor, Stephen E., to Uniroyal, Inc. Metal-rubber adhesion system. 3,926,703, Cl. 156-124.000.

Cantor, Stephen E.; and Brett, Thomas J., Jr., to Uniroyal, Inc. Polyols containing cyanoalkyl ether groups. 3,927,067, Cl. 260-465.600.

Cantrell, Ben H., to United States of America, Navy. Technique for ranking data observations. 3,927,391, Cl. 340-146.200.

Cap-Con International, Inc.: *See—*
Brooks, Leon E.; and White, James T., 3,926,006.

Carder, Victor H. Flow control device. 3,926,213, Cl. 137-504.000.

Carlick, Daniel J.: *See—*
Rosen, George; Carlick, Daniel J.; and Reiter, Ralph H., 3,926,638.
Rosen, George; Carlick, Daniel J.; and Reiter, Ralph H., 3,926,639.

Carlson, Paul A.; and Cake, Arthur F., to Wagner Electric Corporation. Self-adjusting condition-responsive control circuit. 3,927,336, Cl. 307-308.000.

Caron, Lionel, to Bell Telephone Laboratories, Incorporated. Conditional skew compensation arrangement. 3,927,392, Cl. 340-146.1BE.

Carpenter, Kenneth B., to Ethyl Corporation. Apparatus for handling rolls. 3,926,466, Cl. 294-64.00R.

Carpentier, Felix Joanna Petrus: *See—*
Wuyts, Oscar; Carpentier, Felix Joanna Petrus; and Wouters, Ludovicus Josephus Albertus, 3,927,277.

Carter, Ralph E., to General Electric Company. Process for preparing sintered uranium dioxide nuclear fuel. 3,927,154, Cl. 264-.500.

Cartwright, Ronald Forrester: *See—*
Stevens, Arthur Royden; and Cartwright, Ronald Forrester, 3,925,937.

Case, Derek Frank. Method of manufacturing multi-track magnetic heads. 3,925,884, Cl. 29-603.000.

Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 3,927,395.

Cassella Farbwerke Mainkur AG: *See—*
Meyer, Artur; Gotsmann, Ulrich; and Meyer, Ernst, 3,927,012.

Cassey, Howard N.: *See—*
Jones, Robert J.; and Cassey, Howard N., 3,926,913.

Caterpillar Mitsubshi Ltd.: *See—*
Tanaka, Hiroshi; and Morita, Isao, 3,926,282.

Caterpillar Tractor Co.: *See—*
Blomstrom, Gary D.; Randour, Victor; and York, Lyle E., 3,926,273.
Fuzzell, Joe E., 3,927,399.
Nerstad, Karl A., 3,926,288.

Catron, Marvin C. Stacking trays and container for persihable items. 3,926,363, Cl. 229-2.500.

Cauge, Thomas P.; and Kocsis, Joseph, to Signetics Corporation. Double diffused metal oxide semiconductor structure with isolated source and drain and method. 3,926,694, Cl. 148-187.000.

Cavalear, Charles T., to Varian Associates. Method for making waveguide components. 3,925,883, Cl. 29-600.000.

Cavell, Ian William: *See—*
Matkin, Derek Ivan; Cavell, Ian William; and Dyson, John Raymond, 3,926,857.

Cavitron Corporation: *See—*
Hardway, Edward V., Jr.; and Holtman, William H., 3,926,177.

Cease, Vincent Jay: *See—*
Thomas, Samuel Charles, Jr.; and Cease, Vincent Jay, 3,927,081.

Cellanese Corporation: *See—*
Burns, Kenneth S.; Ferment, George R.; and Waugh, Roger C., 3,926,228.

Cengel, John A.; and Puskas, Imre, to Standard Oil Company. Process of making alkenyl succinic anhydride. 3,927,041, Cl. 260-346.800.

Center, John L., to Vicra Sterile, Inc. Two layer sterile packaging. 3,926,309, Cl. 206-364.000.

Centrax Limited: *See—*
Stevens, Arthur Royden; and Cartwright, Ronald Forrester, 3,925,937.

Centre de Recherches Metallurgiques: *See—*
Etienne, Arlette Therese, 3,926,619.

Centre de Recherches Metallurgiques - Centrum voor Research in de Metallurgie: *See—*
Respen, Yves Jean; Cosse, Paul Andre; and Economopoulos, Mario, 3,926,689.

Centronics Data Computer Corporation: *See—*
Ramsden, Paul S., Jr., 3,926,292.

Century Mfg. Co., Inc.: *See—*
Smith, Leonard S., 3,925,885.

Cerankowski, Leon D.: *See—*
Baron, Richard C.; Cerankowski, Leon D.; and Mattucci, Neil, 3,926,922.

Cerola, Joseph J.: *See—*
Kurek, Edwin J.; and Cerola, Joseph J., 3,926,171.

Ceskoslovenska akademie ved: *See—*
Kotulak, Ludovit; and Svantner, Jiri, 3,926,563.

Cessna, Lawrence C., Jr., to Hercules Incorporated. Thermosetting compositions containing poly(arylacetylenes) and an aromatic ring compound having the rings joined through a keto group. 3,926,897, Cl. 260-32.80R.

Champion International Corporation: *See—*
Roth, Clarence Edward, Jr.; Hughes, Robert L.; and Thompson, Kenneth F. (said Kenneth F. Thompson assors. to), 3,927,245.

Chance, James L.; and Han, Shu Tang, to Beloit Corporation. Hot wire drying. 3,925,906, Cl. 34-18.000.

Chang, Catherine Teh-lin, to Du Pont de Nemours, E. I., and Company. Photopolymerizable compositions comprising initiator combinations comprising thioxanthenones. 3,926,643, Cl. 96-115.00P.

Chao, Albert L.; and Chao, Ethel. Luminated table top with multiple games roll chart. 3,926,439, Cl. 273-136.00A.

Chao, Ethel: *See—*
Chao, Albert L.; and Chao, Ethel, 3,926,439.

Chapman, George D., to Canadian Patents and Development Limited. Optical system for angle measurement by interferometry. 3,926,523, Cl. 356-110.000.

Chappell, Robert L., to International Flavors & Fragrances Inc. Fragrance materials containing cis-2-n-pentyl cyclopropane-1-carboxylic acid. 3,926,860, Cl. 252-522.000.

Charles Stark Draper Laboratory, Inc., The: *See—*
Buck, Sheldon W., 3,926,054.

Charlesworth, Donald, to Pilkington Brothers Limited. Glass melting tank. 3,926,606, Cl. 65-135.000.

Chartrin, Jean Lucien Yves: *See—*
Gendrot, Andre Jean-Claude; and Chartrin, Jean Lucien Yves, 3,926,511.

Charville, William Thomas: *See—*
Seymour, Donald Edwin; da Costa, Nicholas Mario; and Charville, William Thomas, 3,927,203.

Chatfield, Eric John; and Nielsen, Verner Henrick, to Ontario Research Foundation. Method and apparatus for deriving from a scanning electron microscope signals that can be displayed stereoscopically. 3,927,320, Cl. 250-307.000.

Chemie Linz Aktiengesellschaft: *See—*
Roth, Wolfgang, 3,925,993.

Chemische Werke Huls Aktiengesellschaft: *See—*
Feldman, Rainer; Biethan, Uwe; Muller, Karl Adolf; and Panoch, Hans Joachim, 3,927,141.

Chemotronics International, Inc.: *See—*
Vinton, Clarence S.; and Franklin, Charles H., 3,927,186.

Chen, Chia M.: *See—*
Rice, James T.; and Chen, Chia M., 3,927,140.

Chen, Stephen S., to General Motors Corporation. Engine starter motor control for preventing damage during hydraulic lock. 3,927,359, Cl. 318-434.000.

Chen, Tien C.; and Ho, Irving T., to International Business Machines, Corporation. Arithmetic system for halving and doubling decimal numbers. 3,927,311, Cl. 235-159.000.

Chenot, Charles F., to GTE Sylvania Incorporated. Method of converting brushite to monetite crystals with controlled variation in crystal habit. 3,927,180, Cl. 423-308.000.

Cheung, Mo-Fung; and Dickie, Ray A., to Ford Motor Company. Method of making aqueous coating compositions of acrylic polymer latex, acrylic polymer solution, aminoplast and acrylic stabilizer polymer. 3,926,888, Cl. 260-29.4UA.

Chevron Research Company: *See—*
Csicsery, Sigmund M., 3,926,168.
Danzik, Mitchell; and House, Ralph, 3,927,061.
Hodgson, Clive, 3,927,184.
Lapporte, Seymour J.; and Toland, William g., 3,927,078.
Siegel, Jack W., 3,926,785.
Sweeney, William A., 3,927,028.

Chiang, Ching: *See—*
Monte, Alexander A.; and Chiang, Ching, 3,926,735.

Chiba Fine Chemical Co. Ltd.: *See—*
Tomoda, Sadamichi; and Nagao, Nobuo, 3,927,166.

Chibata, Ichiro; Ito, Hiroshi; Morimoto, Tomoaki; Taniguchi, Yukio; and Fujimoto, Tsuneo, to Tanabe Seiyaku Co., Ltd. Method of continuous automatic incubation of bacteria and determination of growth thereof, and apparatus therefor. 3,926,733, Cl. 195-103.500.

Chinuki, Takashi: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,927,114.

Chiou, Jackson K. S.; and Jones, Ronald E., to Texaco Inc. Separation and recovery of secondary alkyl primary amines. 3,927,102, Cl. 260-583.00N.

Chizat, Francois: *See—*
Bourdin, Francois; Chizat, Francois; Costantini, Michel; and Joufffret, Michel, 3,927,122.
Bourdin, Francois; Chizat, Francois; Costantini, Michel; and Joufffret, Michel, 3,927,123.

Choay, Jean: *See—*
Vairel, Edmond G.; Goulay, Jean; and Choay, Jean, 3,926,727.

Choay S.A.: *See—*
Vairel, Edmond G.; Goulay, Jean; and Choay, Jean, 3,926,727.

Choi, Jae Hong; and Miller, Stephen Allen, to DAP, Inc. Pigmented primer composition. 3,926,898, Cl. 260-33.40R.

Chow, Hirotsura: *See—*
Ogura, Shuichi; Chow, Hirotsura; and Kawamata, Toshio, 3,927,244.

Chow, Ling George; and Bartran, David S., to Honeywell Information Systems Inc. Bias field apparatus for magnetic domain memory device. 3,927,397, Cl. 340-174.0TF.

Chow, Poo. Reconstituted board products from plant-fiber residues. 3,927,235, Cl. 428-302.000.

Christian, Donald K. Fabric bulking unit. 3,925,865, Cl. 26-18.500.

Christman, Robert D.; and Yanik, Stephen J., to Gulf Research & Development Co. Plural stage residue hydrodesulfurization process with hydrogen sulfide addition and removal. 3,926,784, Cl. 208-210.000.

Christy, Betty L.: *See—*
Summers, William A.; Christy, Betty L.; and Sweeney, Joseph V., 3,927,308.

Ciastula, Tadeusz Leopold; Rogers, Victor Alfred Baden; and Balmford, David Ernest Hall, to Westland Aircraft Ltd. Semi-rigid rotor systems for rotary wing aircraft. 3,926,536, Cl. 416-135.000.

Ciba-Geigy AG: *See—*
Huber-Emden, Helmut, 3,927,126.
Jaccard, Roland; Hostettler, Paul; and Siegrist, Rudolf, 3,926,917.
Liechti, Peter, 3,926,964.
Luethi, Christian, 3,927,119.
Meyer, Hans Rudolf, 3,926,963.
Peter, Richard; and Angliker, Hansjoerg, 3,927,063.
Schibler, Luzius; and Merz, Jurg, 3,927,089.

Ciba-Geigy Corporation: *See—*
Durr, Dieter; and von Orelli, Marcus, 3,927,087.
Ferrini, Pier Giorgio; Haas, Georges; and Rossi, Alberto, 3,926,961.
Fischer, Hanspeter, 3,926,997.
Greber, Gerd; Darms, Roland; and Lohmann, Dieter, 3,926,911.
Huber-Emden, Helmut; Eschle, Karl; and Maeder, Arthur, 3,927,091.
Kleiner, Eduard K., 3,926,343.
Kristiansen, Odd, 3,927,149.
Schwarzenbach, Kurt; and Rosenberger, Siegfried, 3,927,150.
Werner, Lincoln Harvey, 3,927,218.
Wick, Arnold, 3,927,043.

Cichowski, Robert S., to Phillips Petroleum Company. Catalysts compositions. 3,926,845, Cl. 252-432.000.

Cikalon-Vliesstoffwerk GmbH: *See—*
Lochner, Herbert, 3,925,866.

Cillichemie Ernst Vogelmann: *See—*
Weller, Horst, 3,926,218.

Cimarusti, Christopher M.: *See—*
Rovnyak, George; Narayanan, Venkatachala L.; Haughwitz, Rudiger D.; and Cimarusti, Christopher M., 3,926,982.
Rovnyak, George; Narayanan, Venkatachala L.; Haugwitz, Rudiger D.; and Cimarusti, Christopher M., 3,927,014.

Cincinnati Milacron Inc.: *See—*
Cox, Joseph Henry, Jr., 3,926,447.

Circle, Sidney Joseph; Fergle, Richard Raymond; Watkins, Leslie Ray; and Hooton, Daniel Edwards, to Anderson, Clayton & Co. Protein recovery process from defatted soybeans using water to reduce amount of miscible solvent. 3,926,940, Cl. 260-123.500.

Cistone, David R., to Kerr Glass Manufacturing Corporation. Safety closure. 3,926,328, Cl. 215-220.000.

Citizen Watch Co., Ltd.: *See—*
Ishizuka, Shinichi; and Mihara, Kuniyuki, 3,926,078.
Tanaka, Eiichiro; Nishimura, Katsuo; Shimizu, Hiroshi; and Koshi, Masao, 3,926,502.

Citta, Richard W., to Zenith Radio Corporation. Wireless speaker system using infra-red link. 3,927,316, Cl. 250-199.000.

City Auto Upholstering Co.: *See—*
Nadasi, Laszlo; Nadasi, Marton; Zelenko, John; and Pero, Donald E., 3,926,471.

Claes, Frans Henri, to Agfa-Gevaert. Method of preparing a polyphase system. 3,926,654, Cl. 106-137.000.

Clauss, Karl; Jensen, Harald; and Luck, Erich, to Hoechst Aktiengesellschaft. 3,4-Dihydro-1,2,3-oxathiazine-4-ones and a process for their preparation. 3,926,976, Cl. 260-243.00R.

Clauss, Karl; Schnabel, Horst; and Jensen, Harald, to Hoechst Aktiengesellschaft. Process for preparing 3,4-dihydro-1,2,3-oxathiazine-4-ones. 3,926,981, Cl. 260-243.00R.

Closner, John J.; Marchaj, Tadeusz Josef; and Wichman, Sven Hjalmar, to Preload Technology, Inc. Prestressed concrete tanks for liquid natural gas tankers. 3,926,134, Cl. 114-74.00R.

Coburn, Michael D.; and Benziger, Theodore M., to United States of America, Energy Research and Development Administration. Process for producing 1,5-diacetyl-3,7-dinitro-1,3,5,7-tetraazacyclooctane. 3,926,953, Cl. 260-239.0BC.

Coffey, Gerald P.: *See—*
Li, George S.; and Coffey, Gerald P., 3,926,926.

Cohen, Norman R.; and Syrmopoulos, Demosthenes S., to George A. Goulston Company. Textile fiber lubricants. 3,926,816, Cl. 252-8.900.

Cole, Edward L.: *See—*
McCoy, Frederic C.; and Cole, Edward L., 3,926,839.

Cole, Susan Margaret; Mason, David Robert; and Rothon, Roger Norman, to Imperial Chemical Industries Limited. Coating composition. 3,926,658, Cl. 106-287.000.

Cole, Sylvan: *See—*
Genest, Leonard J.; Feagin, Frederick E.; Cole, Sylvan; and Messner, Daryle, 3,926,021.

Coleman, Claude M. Agitating bag rack and baffle structure for furnace cleaners. 3,926,596, Cl. 55-304.000.

Coleman, Richard L.; Cummins, Billy H.; and Ashton, William B., to Texaco Inc. Production of lubricating oils. 3,926,786, Cl. 208-264.000.

Coleman, Steven J.: *See—*
Bornhorst, Walter J.; Coleman, Steven J.; and O'Brien, James W., 3,926,196.

Colgate-Palmolive Company: *See—*
Baines, Eric; Cropper, Edwin; and Forshaw, Sydney James, 3,927,201.
Gerecht, John Fred, 3,926,861.
Harvey, Kenneth; and Lee, Sydney, 3,927,202.
Mangeli, John Kilolo, 3,926,827.
Perla, Giulio; and Mattiello, Giuseppe, 3,926,863.
Smith, Brian Robson; and Tomlinson, Kenneth, 3,926,829.
Sundby, Bjorn, 3,927,073.
Taylor, Glenn N., 3,926,189.

Colli, J. Louise, to Lawrence Peska Associates, Inc. Sandal shoe. 3,925,915, Cl. 36-11.500.

Collins, William C. Injector for soil treating liquids. 3,926,131, Cl. 111-6.000.

Colln, Reimer; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. O-alkyl-O-pyrazolopyrimidine-thiono-phosphoric acid ester amides. 3,926,998, Cl. 260-256.50R.

Colt Industries Operating Corporation: *See—*
Bell, Oliver A., Jr., 3,927,293.

Coltrinari, Enzo L.: *See—*
Goren, Mayer B.; and Coltrinari, Enzo L., 3,927,169.

Combustion Engineering, Inc.: *See—*
Dupen, Clive Frederick George, 3,926,722.

Comineo Ltd.: *See—*
Geiger, Kenneth Daniel; Horvath, Steven Joseph; Kallay, Victor Paul; Seymour, Theodore Joseph; Watson, Thorpe Wesley; and Zervoudis, John, 3,926,247.

Commercial Decal, Inc.: *See—*
Weingrad, Saul; Wahl, Albert J.; Mucha, Richard C.; and Gould, Robert E., 3,926,710.

Communications Satellite Corporation: *See—*
Sciulli, Joseph A.; Campanella, Samuel Joseph; and Costales, Rene, 3,927,268.

Compagnie des Ateliers et Forges de la Loire (St Chamond, Firminy, St Etienne, Jacob-Holtzer): *See—*
Mornas, Jean Philippe, 3,926,024.

Compagnie Generale d'Automatisme: *See—*
Neeloff, Victor, 3,927,389.

Computer Specialties Corporation: *See—*
Silver, Edward S.; and Tucker, Robert E., 3,926,513.

Concast AG: *See—*
Meier, Walter; Zeller, Josef; Koenig, Peter J.; Bruderer, Werner; and Schmid, Markus, 3,926,244.

Concha C, Teodosio Jose, to Ver-Con, Inc. Astrological apparatus. 3,925,917, Cl. 40-31.000.

Cone, Irwin C., to Gates Rubber Company, The. Fiber-loaded windshield wiper superstructure. 3,925,844, Cl. 15-250.420.

Connelly, Lloyd E.: *See—*
Musgrove, Ronald R.; and Connelly, Lloyd E., 3,926,380.

Conrad Pickel Studios, Inc.: *See—*
Pickel, Robert Paul, 3,925,944.

Consolazio, George A.: *See—*
Kalafatas, Nicholas J.; Rosenthal, Harold; and Consolazio, George A., 3,927,221.

Constantinescu, Petre; Hristea, Nicolae; Blebea, Speranta; Hristea, Ieronim; Huniadi, Mihai; and Gabureanu, Mircea, to Intreprinderea 30 Decembrie. Air conditioning, soil irrigation, fertilization and pest-fighting plant for use in greenhouses. 3,925,928, Cl. 47-17.000.

Construction Engineering Products: *See—*
Franc, Eugene K., 3,926,400.

Container Corporation of America: *See—*
Smith, Curtis J., 3,926,098.

Continental Can Company, Inc.: *See—*
O'Neill, Roger M.; and Kennedy, John B., Jr., 3,926,337.
Zavasnik, Fred J., 3,926,324.

Continental Oil Company: *See—*
Durr, Albert M.; and Krenowicz, Robert A., 3,926,823.
Libbey, William J., 3,927,058.
Libbey, William J.; and Lundeen, Allan J., 3,927,059.
Libbey, William J., 3,927,060.
Thomas, Samuel Charles, Jr.; and Cease, Vincent Jay, 3,927,081.

Cook, Martin Christopher: *See—*
Gregson, Michael; Cook, Martin Christopher; and Gregory, Gordon Ian, 3,926,957.

Cook, Melvin A.; and Hagmann, Mark J., to Ireco Chemicals. Explosive compositions containing metallic fuel particles and method of preparation thereof. 3,926,698, Cl. 149-44.000.

Cook, Thomas H.: *See—*
Beck, Herman D.; and Cook, Thomas H., 3,926,362.

Cooper, Charles S.: *See—*
Lawson, John B.; and Cooper, Charles S., 3,926,381.

Cooper, Glenn F., to Standard Electric Time Corporation. Time division multiple access communication system for status monitoring. 3,927,404, Cl. 340-413.000.

Coors Porcelain Company: *See—*
Fenerty, Michael J.; and Mustoe, David L., 3,926,443.

Copal Company Limited: *See—*
Inoue, Nobuyoshi, 3,927,416.

Copeland, George G., to Copeland Systems Inc. Method for producing ammonia-base pulping liquor from spent liquor. 3,927,174, Cl. 423-155.000.

Copeland Systems Inc.: *See—*
Copeland, George G., 3,927,174.

Copenhafer, Dennis Lee, to Bell Telephone Laboratories, Incorporated. Duplex signaling circuit. 3,927,257, Cl. 178-60.000.

Copolymer Rubber & Chemical Corporation: *See—*
Boozer, Charles E., 3,926,901.

Corbett, Paul M.; and Fedock, Michael P., to SCM Corporation. Flux for continuous casting of steel. 3,926,246, Cl. 164-56.000.

Corbin, Christopher L. T.: *See—*
Crissy, Charles F.; Sherwin, Owen W.; and Corbin, Christopher L. T., 3,926,467.

Cordes, Linus F.; and Garfinkel, Marvin, to General Electric Company. Schottky barrier contacts and methods of making same. 3,927,225, Cl. 427-84.000.

Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, to Ford Motor Company. Making an anode assembly. 3,926,772, Cl. 204-283.000.

Corning Glass Works: *See—*
Andrus, Ronald L.; and Reade, Richard F., 3,926,602.
Miller, David M., 3,926,648.
Reade, Richard F., 3,926,838.

Cosden Oil & Chemical Company: *See—*
Medley, Ronald D., 3,927,160.
Watson, James M., 3,927,110.

Coski, William D., to Ingersoll-Rand Company. Method of boring rock. 3,926,268, Cl. 175-62.000.

Cosse, Paul Andre: *See—*
Respen, Yves Jean; Cosse, Paul Andre; and Economopoulos, Mario, 3,926,689.

Costales, Rene: *See—*
Sciulli, Joseph A.; Campanella, Samuel Joseph; and Costales, Rene, 3,927,268.

Costantini, Michel: *See—*
Bourdin, Francois; Chizat, Francois; Costantini, Michel; and Joufret, Michel, 3,927,122.
Bourdin, Francois; Chizat, Francois; Costantini, Michel; and Joufret, Michel, 3,927,123.

Costanza, Carl C.; Weber, Walter W.; Betlejewski, Frank W.; and Frystak, Richard, to Bell & Howell Company. Slide projector loading-unloading station. 3,926,514, Cl. 353-113.000.

Costruba, Peter, to Angeles Metal Trim Co. Support structure for shelving. 3,925,939, Cl. 52-36.000.

Coulter Electronics, Inc.: *See—*
Liedholz, Gerhard A., 3,927,317.

Courtaulds Limited: *See—*
Flavell, John; and Jeffcoat, Keith, 3,926,016.

Cowell, Thomas E., to Rockwell International Corporation. Device for guiding sensor movement within a tube. 3,926,040, Cl. 73-67.80S.

Cox, Donald Clyde; Langseth, Rollin Edward; Reudink, Douglas Otto John; and Rustako, Anthony Joseph, Jr., to Bell Telephone Laboratories, Incorporated. Linear amplification using nonlinear devices and inverse sine phase modulation. 3,927,379, Cl. 330-10.000.

Cox, Joseph Henry, Jr., to Cincinnati Milacron Inc. Collet-type work holder. 3,926,447, Cl. 279-57.000.

Coy, Brent E.: *See—*
Cannon, Thomas C., Jr., 3,926,434.

Coyne Cylinder Company: *See—*
Sisco, Willie J., Jr.; Long, Cecil L.; and Kifer, James M., 3,926,652.

Cragar, Darryl E.: *See—*
Willis, Gordon G.; Ivy, John B.; Boozalis, Theodore S.; and Cragar, Darryl E., 3,927,132.

Craig, John D., Jr.: *See—*
Allen, James S.; and Craig, John D., Jr., 3,926,760.

Crane, Paul R. Portable saw mill. 3,926,086, Cl. 83-801.000.

Crenne, Noel: *See—*
Brunie, Jean-Claude; and Crenne, Noel, 3,927,105.

Creswick, William E.; and Hunt, Patrick J., to Algoma Steel Corporation, Limited, The. High-strength low-alloy steel. 3,926,686, Cl. 148-12.00F.

Creusot-Loire Enterprises: *See—*
Gay, Pierre, 3,926,353.

Crinos Industria Farmacobiologica SpA: *See—*
Butti, Adriano; and Prino, Giuseppe, 3,926,921.

Crissy, Charles F.; Sherwin, Owen W.; and Corbin, Christopher L. T., to Aeroquip Corporation. Aircraft cargo hook. 3,926,467, Cl. 294-83.00R.

Crist, Buckley: *See—*
Low, Jack B.; Crist, Buckley; and Zoltner, Thomas J., 3,926,347.

Croft, Robert; and Lippiatt, Raymond, to Avon Rubber Company Limited. Method of resealing pipe joints. 3,927,158, Cl. 264-36.000.

Crone, John M., Jr.: *See—*
Suggitt, Robert M.; and Crone, John M., Jr., 3,926,842.

Cropper, Edwin: *See—*
Baines, Eric; Cropper, Edwin; and Forshaw, Sydney James, 3,927,201.

Crossman, Richard L., to Goodyear Aerospace Corporation. Telescopic piston for added brake wear adjustment. 3,926,283, Cl. 188-196.00B.

Crovetti, Aldo Joseph; Blank, Artur; and Germann, Richard Paul, to Abbott Laboratories. Process for producing amino phenyl iodomethyl sulfones. 3,927,100, Cl. 260-578.000.

Crowell, Lee T.: *See—*
Burke, William F.; Crowell, Lee T.; Greenwood, Robert C.; and Jones, Thomas E., 3,926,291.

Crown Zellerbach Corporation: *See—*
Ozretich, Thomas M., 3,927,118.

Csicsery, Sigmund M., to Chevron Research Company. Single stage cold start and evaporative control system using a bimodal adsorbent bed. 3,926,168, Cl. 123-180.00R.

Cuccio, John D.: *See—*
La Fata, John E.; and Cuccio, John D., 3,925,923.

Cullen, Ray H.; and Aker, Jimmie R., to Roy H. Cullen Research. Method and apparatus for earth boring. 3,926,269, Cl. 175-104.000.

Culligan International Company: *See—*
Elliott, Eugene R., 3,926,071.

Cummings, William M., to Texaco Inc. Hydrocarbyl amine substituted propionic ester and motor fuel composition containing same. 3,926,578, Cl. 44-58.000.

Cummins, Alonzo E.: *See—*
Evans, Robert T.; Cummins, Alonzo E.; and Anderson, Merlin F., 3,926,254.

Cummins, Billy H.: *See—*
Coleman, Richard L.; Cummins, Billy H.; and Ashton, William B., 3,926,786.

Cupo, William J. Method of assembling carton blanks. 3,926,096, Cl. 93-49.00M.

Curelop, Edward J.; and Marincic, Nikola, to P. R. Mallory & Co. Inc. Reactive mixture for fabricating amalgamaled chloride free zinc anode. 3,926,672, Cl. 136-30.000.

Curtis, Donald A., to TRW Inc. Method of joining bolts or rivets to nuts. 3,925,876, Cl. 29-509.000.

Custer, Peter Anderson. Motion picture film soundtrack and method for production thereof. 3,926,633, Cl. 96-68.000.

Cywin, Allen, to United States of America, Environmental Protection Agency. Disposal of waste heat. 3,926,743, Cl. 203-10.000.

Czuha, Michael, Jr., to Du Pont de Nemours, E. I., and Company. Deposition of P_2O_5 in an electrolytic moisture cell. 3,926,745, Cl. 204-1.00T.

da Costa, Nicholas Mario: *See—*
Seymour, Donald Edwin; da Costa, Nicholas Mario; and Charville, William Thomas, 3,927,203.

Dahlmeier, Stanley W.: *See—*
Dean, Gerald R., 3,926,234.

Dahlquist, Jon G. Multiple driver dynamic loud speaker. 3,927,261, Cl. 179-1.00E.

Dai Nippon Toryo Co. Ltd.: *See—*
Tsugukuni, Hideyoshi; Kano, Masafumi; and Matsuda, Mitsuhiro, 3,926,875.

Daido Seiko Kabushiki Kaisha: *See—*
Asada, Chiaki; and Watanabe, Toshiyuki, 3,926,621.

Daimler-Benz AG: *See—*
Bermanseder, Robert; and Bermanseder, Norbert, 3,926,100.

Daimler-Benz Aktiengesellschaft: *See—*
Jantzen, Hermann; Kuffel, Karl; and Puchta, Herbert, 3,926,068.
Lamm, Heinz, 3,926,539.
Paul, Jurgen; Kostelezky, Walter; and Schwerdt, Paul, 3,927,339.
Scherenberg, Hans O., 3,926,152.
Van Winsen, Friedrich H., 3,926,454.

Dainichiswika Color & Chemicals Mfg. Co., Ltd.: *See—*
Horiguchi, Shojiro; Nakamura, Michiei; Nakajima, Keiji; and Seino, Yoshio, 3,926,830.

Dainippon Pharmaceutical Co., Ltd.: *See—*
Yoshimura, Yoshio; Yokogawa, Kanae; and Kawata, Shigeo, 3,927,200.

Dale-Jones Corporation: *See—*
Werry, Arthur W., 3,927,315.

Damiano, John Joseph, to Amchem Products, Inc. Nitration process. 3,927,127, Cl. 260-646.000.

Danfoss A/S: *See—*
De Lepeleire, Guido Amandus, 3,926,102.
Rasmussen, Ivar, 3,926,210.

Dangles, Elsie R. M.: *See—*
Dangles, Thomas C.; and Dangles, Elsie R. M., 3,926,335.

Dangles, Thomas C.; and Dangles, Elsie R. M. Capsule or pill dispenser-sure way dial a pill. 3,926,335, Cl. 221-82.000.

D'Anna, Ronald F.; and Llewellyn, Richard E., to United States of America, Air Force. Digital test apparatus. 3,927,310, Cl. 235-153.0AC.

Dannhorn, Erich: *See—*
Wildmoser, Alfred; and Dannhorn, Erich, 3,926,591.

Dantowitz, Philip; and Holmes, William A. Vehicle automatic transmission bicycle with alternate fixed ratio or variable ratio speed sensitive power paths. 3,926,020, Cl. 74-217.00B.

Danzik, Mitchell; and House, Ralph, to Chevron Research Company. Phosphate-free carboxylate-sulfate detergents. 3,927,061, Cl. 260-458.000.

DAP, Inc.: *See—*
Choi, Jae Hong; and Miller, Stephen Allen, 3,926,898.

Darms, Roland: *See—*
Greber, Gerd; Darms, Roland; and Lohmann, Dieter, 3,926,911.

Dart Industries, Inc.: *See—*
Bowen, Stephen T., 3,926,902.

Datschefski, Arthur E.: *See—*
Deming, Dale R.; and Datschefski, Arthur E., 3,926,330.

Davidson, William E., to General Electric Company. Iron minder. 3,926,392, Cl. 248-117.100.

Davies, George; and Wertheimer, Hedda. Double reflection viewing instrument. 3,926,509, Cl. 350-301.000.

Davies, John Sydney: *See—*
Burton, George; Davies, John Sydney; and Hubbard, Ann Frances, 3,926,955.

Davis, George T.: *See—*
Breyer, Frederick; Davis, George T.; and Krusche, Edwin C., 3,926,146.

Davis, Gordon H.; and Joehler, Klaus, to Stromberg-Carlson Corporation. Automatic number identification having four-party detection. 3,927,270, Cl. 179-17.00A.

Davis, Robert E. Method for measuring conversion efficiency of catalysts. 3,926,558, Cl. 23-230.00R.

Davis, Stephen A.; Dougherty, Keith H.; Levit, Alan D.; Hendrickson, Thomas A.; and Sanderson, Kenneth R., to International Business Machines Corporation. Apparatus for processing music as data. 3,926,088, Cl. 84-462.000.

Day, Paul L.: *See—*
Konas, William W.; Day, Paul L.; and Budzinski, Roger R., 3,926,415.

Dean, Gerald R., to Dahlmeier, Stanley W. Container for storing keys. 3,926,234, Cl. 150-40.000.

De Bough, Bjorn N. Audio signalling system having probes for monitoring the characteristics of a material. 3,927,370, Cl. 324-65.00R.

Debus, Henri R.: *See—*
Cahen, Raymond M.; Debus, Henri R.; and Andre, Jacques M. J. G., 3,926,852.
De Hault, Emmanuel R. E. G. Draguez Tripels; Van Tongelen, Marcel; and Debus, Henri R., 3,927,039.

Decker, Klaus: *See—*
Zettl, Heinrich; and Decker, Klaus, 3,927,296.

Deere & Company: *See—*
Wagenhals, Fred William, 3,925,968.

Deering Milliken Research Corporation: *See—*
Foster, Larry R.; and Kuhn, Hans H., 3,927,044.
Gilpatrick, Michael William, 3,925,864.

De Falco, Gianfranco: *See—*
Zambolin, Adriano; and De Falco, Gianfranco, 3,927,274.

De Gregorio, Paul V., to Stolt-Nielsen, Inc. Multipurpose pipeline system for handling fluids on liquid cargo vessels. 3,926,135, Cl. 114-74.00R.

De Hault, Emmanuel R. E. G. Draguez Tripels; Van Tongelen, Marcel; and Debus, Henri R., to Labofina S. A. Purification of pyromellitic dianhydride. 3,927,039, Cl. 260-346.300.

Deitch, James C.; and Robert, Lawrence A., to Magnetic Controls Company. Telephone isolation jack panel. 3,927,275, Cl. 179-97.000.

de Klein, Willem J., to Akzo N.V. Process for the preparation of an unsaturated carboxylic acid. 3,927,051, Cl. 260-413.000.

Delaney, Francis Bud. Foot shower and spray device. 3,925,830, Cl. 4-182.000.

De Lepeleire, Guido Amandus, to Danfoss A/S. Air injecting apparatus for air conditioners or the like. 3,926,102, Cl. 98-102.000.

Deller, Robert J., to Pullman Incorporated. Integral clip crossmember. 3,926,530, Cl. 403-167.000.

DeLorean, John Z., to John Z. DeLorean Corporation. Racket. 3,926,431, Cl. 273-73.00D.

Del Vecchio, Oscar. Shoe having a two-part vamp. 3,925,913, Cl. 36-11.500.

de Metz, Elisabeth: *See—*
Lanoe, Bernard; and de Metz, Elisabeth, 3,927,375.

Deming, Dale R.; and Datschefski, Arthur E., to All-Steel Inc. Knockout arrangement for molded plastic electrical boxes. 3,926,330, Cl. 220-3.900.

Demmel, Edward J.: *See—*
Owen, Hartley; and Demmel, Edward J., 3,926,778.

Demole, Edouard P., to Firmenich S.A. 6,8-Dioxa-bicyclo [3.2.1] octane and 2,9-dioxa-bicyclo [3.3.1] nonane derivatives. 3,927,030, Cl. 260-340.300.

Dengel, Ferdinand; Ehrmann, Oskar; Friedrich, Ludwig; and Zimmermann, Frank, to Knoll A.G. Chemische Fabriken. Theophylline derivatives. 3,926,995, Cl. 260-256.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Kadowaki, Takashi; Iwasaki, Takao; and Matsumura, Hideki, 3,927,130.

Denley, Ronald S., to Teletype Corporation. Selectively illuminated pushbutton switch. 3,927,290, Cl. 200-314.000.

De Nora, Oronzio; Bianchi, Giuseppe; Nidola, Antonio; and Trisoglio, Giovanni, to Electronor Corporation. Method of electrowinning metals. 3,926,751, Cl. 204-105.00R.

de Paul Clark, Vincent, to Owens-Corning Fiberglas Corporation. Hardenable, water-based coating composition from aqueous latices of acrylic and vinyl compounds. 3,926,894, Cl. 260-29.6MP.

de Putter, Warner Jan, to Wavin B.V. Device for membrane filtration. 3,926,813, Cl. 210-321.000.

Der Marderosian, Dikrun; and Tremblay, Paul Albert, to W. R. Grace & Co. Method and apparatus for producing foamed thermoplastic insulation boards. 3,926,714, Cl. 156-516.000.

De Santis, Sergio; Farello, Giovanni; and Torrani, Roberto. Continuous feed device for filiform bodies particularly for rotating welding machines for pipes. 3,926,354, Cl. 226-108.000.

Desitter, Gerard; and Vivant, Gilbert, to Rhone-Poulenc S.A. Flameproofing of linear polyesters. 3,927,231, Cl. 427-390.000.

Deusing, Erich; Bernhardt, Helmut; and Durth, Wilfried, to Burger Eisenwerke Aktiengesellschaft. Food-treatment apparatus with circulated hot combustion gas. 3,926,106, Cl. 99-447.000.

Deutsche Automobilgesellschaft mbH: *See—*
Benczur-Urmossy, Gabor, 3,926,844.

Deutsche God- und Silber-Scheideanstalt vormals Roessler: *See—*
Lussling, Theodor; Schaefer, Hans; and Weigert, Wolfgang, 3,927,007.

Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler: *See—*
Birtigh, Gerhard; Parbel, Horst; and Sauer, Heinrich, 3,926,565.
Lussling, Theodor; Schaefer, Hans; and Weigert, Wolfgang, 3,926,856.
Noll, Ewald; Schaefer, Hans; Schmid, Horst; and Weigert, Wolfgang, 3,926,744.

Deutsche Texaco Aktiengesellschaft: *See—*
Meyer-Stoll, Hans-Albrecht; Wollner, Johannes; and Schittek, Hans-Heinz, 3,927,198.

Devilbiss, Roy J., to Philip Morris Inc. Punch mechanism for modifying cigarette machine magazines. 3,925,891, Cl. 30-362.000.

De Vlieg, Garrett H.: *See—*
Bissell, Sherman M.; De Vlieg, Garrett H.; and Hopland, Johan N., 3,926,479.

DeWiant Corporation: *See—*
Priceman, Seymour, 3,926,574.

D'Hooge, Richard E., to Rixson-Firemark, Inc. Electrically actuated door holder and release. 3,926,461, Cl. 292-275.000.

Diamond Shamrock Corporation: *See—*
Lieb, Donald F.; and Stillman, Neil W., 3,926,771.

Dias, Francesco: *See—*
Luhleich, Hartmut; Nickel, Hubertus; and Dias, Francesco, 3,927,187.

Dickert, Joseph J., Jr.; and Heiba, El-Ahmadi I., to Mobil Oil Corporation. Grease compositions. 3,926,820, Cl. 252-33.000.

Dickert, Joseph J., Jr.; and Rowe, Carleton N., to Mobil Oil Corporation. Lubricating compositions containing metal phosphonates. 3,927,232, Cl. 427-401.000.

Dickey-john Corporation: *See—*
Knepler, John T., 3,927,400.

Dickie, Ray A.: *See—*
Cheung, Mo-Fung; and Dickie, Ray A., 3,926,888.

Dickinson, Charles F.: *See—*
Britain, Cecil E., 3,926,895.

Dickinson, Ryta M.: *See—*
Britain, Cecil E., 3,926,895.

Dickinson, Warren D., to United States of America, Army. Vector rotator. 3,927,312, Cl. 235-189.000.

Dickmann, Daniel J.: *See—*
Fourier, Walter A.; and Dickmann, Daniel J., 3,926,879.

Diehl: *See—*
Raab, Richard, 3,926,022.

DiMarcello, Frank Vincent, to Bell Telephone Laboratories, Incorporated. Lead-free glaze for high density alumina. 3,927,238, Cl. 428-336.000.

Dimroth, Peter; Gaeng, Manfred; and Ruider, Guenther, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Azo pigments with an anthraquinonyl component and a β-hydroxynaphthoic acid component substituted by a trimellitic acid imide via an O-phenylenediamine. 3,926,943, Cl. 260-152.000.

Dimroth, Peter; and Radtke, Volker, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Dioxazine dyes. 3,926,987, Cl. 260-246.00R.

Dimyan, Magid Y., to Canadian Patents & Development Limited. Magnetic bubble propagation circuit. 3,927,398, Cl. 340-174.0TF.

Diplomat AG: *See—*
Gujer, Henri, 3,926,545.

Dixon, Charles H., to RBP Chemical Corporation. Method of preparing printed circuit boards with terminal tabs. 3,926,699, Cl. 156-3.000.

Dixon, Jack R., to Indian Head, Inc. Football passer. 3,926,170, Cl. 124-8.000.

Dixon, Percy; and Madigan, David C., to Warman, Charles Harold. Hydrometallurgical recovery of copper nickel or zinc from sulphide ores by oxidation in ammoniacal chloride or nitrate solutions. 3,927,170, Cl. 423-33.000.

Dobinson, Frank; and Pelezo, Chris A., to Monsanto Company. Process for preparing spinning solutions. 3,926,887, Cl. 260-29.20N.

Doering, Charles W., to Brinly-Hardy Co., Inc. Debris collecting apparatus. 3,926,108, Cl. 100-177.000.

Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Vacuum molded column-type display device for parallelepiped-shaped objects. 3,926,314, Cl. 211-71.000.

Dohgane, Iwao: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,927,114.

Doi, Yuzuru: *See—*
Isojima, Imao; Doi, Yuzuru; and Hara, Shinji, 3,926,290.

Doke, Jack, to Angeles Metal Trim Co. Method of constructing a prefabricated wall module. 3,925,875, Cl. 29-509.000.

Dolezel, Milan: *See—*
Stloukal, Mojmir; Syrovatka, Zdenek; Dolezel, Milan; and Stripek, Karel, 3,926,130.

Dolidze, Vladimir Romanovich: *See—*
Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovidh; Zakharova, Nina Vasilievna; Golubenko, Mikhail Afanasievich; Tolstikov, Genrikh Alexandrovich; Kholodovskaya, Rakhil Samoilovna; Shalimova, Zoya Stepanovna; Legostaeva, Taisia Vasilievna; Popov, Vasily Dmitrievich; and Dolidze, Vladimir Romanovich, 3,927,038.

Dolza, John, Sr. Segregated lean-rich fed spark ignition engine. 3,926,158, Cl. 123-75.00B.

Donakowski, William A.: *See—*
Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,926,772.

Donn H. Gross: *See—*
O'Connell, Harry P., Jr.; and Hopster, Eugene E., 3,925,940.

Dooley, Milton T., to Reynolds Metals Company. Magneto hydrodynamic generator. 3,927,337, Cl. 310-11.000.

Dorgnon, Roger, to Societe de Prospection et d'Inventions Techniques SPIT. Electropneumatic hammer. 3,926,266, Cl. 173-110.000.

Dorr-Oliver Incorporated: *See—*
Wall, Clarence J., 3,926,129.

Dougherty, Keith H.: *See—*
Davis, Stephen A.; Dougherty, Keith H.; Levit, Alan D.; Hendrickson, Thomas A.; and Sanderson, Kenneth R., 3,926,088.

Dover Corporation: *See—*
Madden, Michael J.; Murray, Robert L.; Lemon, Stephen C.; and Ostand, Paul R., 3,926,231.

Dow Chemical Company, The: *See—*
Goralski, Christian T.; and Klingler, Thomas C., 3,927,090.
Greenawalt, Eddie Lee; and Geren, Lorenzo Dow, 3,925,963.
Gritzner, Gerhard, 3,926,769.
Gross, James R.; and McFadden, Russell T., 3,926,891.
Murchison, Craig B., 3,926,803.
Pawloski, Chester E., 3,927,004.
Quock, Billy; Kelley, Don Howard; Warneke, Sehon Lester; and Gurgiolo, Arthur E., 3,926,867.
Ruetman, Sven H.; and Watson, Richard N., 3,927,003.
Stevens, Timothy S., 3,926,559.
Ward, Joe Arthur, 3,927,131.
Willis, Gordon G.; Ivy, John B.; Boozalis, Theodore S.; and Cragar, Darryl E., 3,927,132.

Dow Corning Corporation: *See—*
Keil, Joseph W., 3,926,885.

Doyle, Thomas: *See—*
Fjarlie, Earl John; Doyle, Thomas; and Teare, Melvin John, 3,927,383.

Dresser Industries, Inc.: *See—*
Abney, Dave L.; Williams, Robert C.; and Gilbert, Horace E., 3,926,409.

Driessen, Antonius Jozephus Gerardus Cornelis: *See—*
Beijer, Louis Benjamin; Driessen, Antonius Jozephus Gerardus Cornelis; and Jacobs, Cornelis Adrianus Joannes, 3,927,343.

Dryden Corporation: *See—*
Dryden, Gale E.; and Harris, Derrick, 3,926,379.

Dryden, Eugene H., to United States of America, Air Force. Compatible scanning system. 3,927,258, Cl. 178-6.800.

Dryden, Gale E.; and Harris, Derrick, to Dryden Corporation. Syringe disintegrator. 3,926,379, Cl. 241-69.000.

Dryden, Gale E. Tubing adaptor. 3,926,458, Cl. 285-177.000.

DSO "ELPROM": *See—*
Pissarev, Angel Nikolaev; Miteva, Maria Pancheva; Balabanov, Ivan Velev; and Peychev, Lyubomir Dimov, 3,926,495.

Dub, Karl; and Biricz, Stefan, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Apparatus for adjusting the position of a V-shaped tundish in two-strand continuous casting plants. 3,926,346, Cl. 222-160.000.

Dubos, Denise: *See—*
Savostianoff, Dimitri; and Dubos, Denise, 3,927,024.

Duchesneau, Eugene A., Jr.; and Boudreau, Donald F., to Borden, Inc. Preparation of plasticized latexes using high-density vibrational energy. 3,926,889, Cl. 260-29.6PM.

Dudek, Edmund C.: *See—*
Bardwell, Francis G.; and Dudek, Edmund C., 3,926,264.

Duke, John A. Well conduit cementing adapter tool. 3,926,253, Cl. 166-88.000.

Duke, Spencer E.; and Stevens, Gerald L., to Atlantic Richfield Company. Well production signal means. 3,926,047, Cl. 73-151.000.

Dumoulin, Jean, to Rhone-Poulenc, S.A. Organosilicon compositions for the non-stick coating of cellulosic or synthetic materials. 3,926,896, Cl. 260-31.20R.

Dunbar, Frank C.; and Oganowski, Kasimir, to Armco Steel Corporation. Aluminized steel. 3,926,572, Cl. 29-196.200.

Duncan, Ernest R. Teaching machine. 3,925,909, Cl. 35-9.00A.

Dunlap, Glenn H.: *See—*
Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V., 3,927,342.

Dunlap, Peter; and Sullivan, Daniel W. Apparatus for applying deodorizing chemicals to compacted refuse. 3,926,107, Cl. 100-45.000.

Dunn, Kirkley J. Paint brush and paint roller cleaning device. 3,925,908, Cl. 34-58.000.

Dupen, Clive Frederick George, to Combustion Engineering, Inc. Reactor vessel head support arrangement. 3,926,722, Cl. 176-87.000.

Du Pont de Nemours, E. I., and Company: *See—*
Adams, Charles D., 3,927,069.
Allen, James S.; and Craig, John D., Jr., 3,926,760.
Chang, Catherine Teh-lin, 3,926,643.
Czuha, Michael, Jr., 3,926,745.
Eigenbrode, George Thomas, 3,926,497.
Glaeser, Hans Hellmut, 3,926,614.
Gosser, Lawrence Wayne, 3,927,056.
Graham, Boynton; and Ingersoll, H. Gilbert, 3,926,826.
Jayawant, Madhusudan D., 3,927,189.
Mastrangelo, Sebastian Vito Rocco, 3,926,916.
Neumer, John Fred, 3,927,065.
Reese, Cecil E., 3,927,167.
Wiggill, John Bentley, 3,925,996.

Durand, Francois. Gear transmission reduction for division of power. 3,926,064, Cl. 74-421.00R.

Duranleau, Roger G.; and Larkin, John M., to Texaco Inc. Preparation of alkylamides. 3,927,050, Cl. 260-404.000.

Duranleau, Roger G.: *See—*
Kablaoui, Mahmoud S.; and Duranleau, Roger G., 3,927,049.

Duranleau, Roger George; and Love, Richard F., to Texaco, Inc. Preparation of alkylamides. 3,927,048, Cl. 260-404.000.

Durr, Albert M.; and Krenowicz, Robert A., to Continental Oil Company. Turbine oil compositions. 3,926,823, Cl. 252-49.900.

Durr, Dieter; and von Orelli, Marcus, to Ciba-Geigy Corporation. New thiourea derivatives. 3,927,087, Cl. 260-552.00R.

D'Urso, Anthony M., to Sonic Corporation. Apparatus for producing acoustic vibrations in liquids. 3,926,413, Cl. 259-4.00R.

Durth, Wilfried: *See—*
Deusing, Erich; Bernhardt, Helmut; and Durth, Wilfried, 3,926,106.

Dybas, Richard A.: *See—*
Rogers, Edward F.; Dybas, Richard A.; and Hannah, John, 3,926,935.

Dykes, Ralph E.; and Mitchell, Robert M., to General Foods Corporation. Tetrahedral packaging means and method of making same. 3,925,959, Cl. 53-28.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Ismail, Roshdy; Lenz, Arnold; and Termin, Erich, 3,927,151.
Klunsch, Maximilian; Lingens, Paul; and Ratz, Heinz, 3,926,696.

Dyson, John Raymond: *See—*
Matkin, Derek Ivan; Cavell, Ian William; and Dyson, John Raymond, 3,926,857.

E. Mollers, Maschinenfabrik, Firma: *See—*
Birkenfeld, Richard; and Wieligmann, Friedrich, 3,925,964.

E. R. Squibb & Sons, Inc.: *See—*
Breuer, Hermann, 3,926,985.
Haugwitz, Rudiger D.; and Narayanan, Venkatachala L., 3,926,967.
Krapcho, John; and Turk, Chester Frank, 3,926,968.
Krapcho, John; and Turk, Chester Frank, 3,926,988.
Rovnyak, George; Narayanan, Venkatachala L.; Haughwitz, Rudiger D.; and Cimarusti, Christopher M., 3,926,982.
Rovnyak, George; Narayanan, Venkatachala L.; Haugwitz, Rudiger D.; and Cimarusti, Christopher M., 3,927,014.
Sowinski, Francis Alexander; and Vogt, B. Richard, 3,926,977.
Treuner, Uwe D.; and Breuer, Hermann, 3,926,979.
Treuner, Uwe D.; and Breuer, Hermann, 3,926,980.
Treuner, Uwe D.; and Breuer, Hermann, 3,926,983.
Yale, Harry Louis, 3,927,093.

E-Z Machine Corporation: *See—*
Lowe, William F.; and Bondy, Harry L., 3,926,713.

Earl, Webster B., to Fairchild Industries, Inc. Pressure regulator. 3,926,204, Cl. 137-116.500.

Eastman Kodak Company: *See—*
Bianchi, Thomas A., 3,927,117.
Gysling, Henry L., 3,927,055.
Holmes, Jerry D., 3,927,035.
Sauter, Frederick J., 3,926,970.

Eaton, John Littell, Jr.; Brill, Richard Henry; and Myers, Walter E., to SCM Corporation. Percolator top fastening means. 3,926,333, Cl. 220-320.000.

Ebasco Services Incorporated: *See—*
Summers, William A.; Christy, Betty L.; and Sweeney, Joseph V., 3,927,308.

Economopoulos, Mario: *See—*
Respen, Yves Jean; Cosse, Paul Andre; and Economopoulos, Mario, 3,926,689.

Edelson, Nathan Allen; and Faessinger, Robert W., to Scott Paper Company. Flame-retardant cellulosics containing graft copolymerized acrylic esters or amides. 3,926,872, Cl. 260-17.4GC.

Edenhofer, Albrecht, to Hoffman-La Roche Inc. Tetrahydrooxazine derivatives. 3,926,986, Cl. 260-244.000.

Edenhofer, Albrecht, to Hoffmann-La Roche Inc. Tetrahydropyridine derivatives. 3,927,006, Cl. 260-294.80G.

Edgar, Owen Burchell; and Yates, Michael Richard, to Imperial Chemical Industries Ltd. Polyamide copolymers from hexamethylene diammonium adipate/terephthalate and a third polyamide forming reactant. 3,926,924, Cl. 260-78.00R.

Edmundson, Robert J.: *See—*
O'Neill, John J.; Komor, Joseph A.; Babcock, Thomas E.; Edmundson, Robert J.; and Shay, Edward G., 3,926,828.

Effmert, Alexander; and Neitzel, Ulrich, to Kali und Salz Aktiengesellschaft. Granular MgO-containing potassium salt fertilizers and process for their manufacture. 3,926,609, Cl. 71-31.000.

Eguchi, Naoki: *See—*
Gondo, Hisashi; Eguchi, Naoki; Yoshimura, Takafumi; and Araki, Masaki, 3,926,687.

Ehrmann, Oskar: *See—*
Dengel, Ferdinand; Ehrmann, Oskar; Friedrich, Ludwig; and Zimmermann, Frank, 3,926,995.

Eichler, Horst. Drive for hydrofoil boat. 3,926,138, Cl. 115-29.000.

Eigenbrode, George Thomas, to Du Pont de Nemours, E. I., and Company. Connector shroud and assembly. 3,926,497, Cl. 339-91.00R.

Eischen, Clement G., Sr. Cervical-dorsal relaxation pad. 3,926,181, Cl. 128-68.000.

Eisenwerk-Gesellschaft Maximilianshutte mgH: *See—*
Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans-Georg, 3,926,618.

Eisert, Manfred; and Schmeidl, Karl, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of auramine salts and auramine salt solutions. 3,927,095, Cl. 260-566.00R.

Ekman, Willard J.: *See—*
Phillippi, Conrad M.; Stevison, Donald F.; and Ekman, Willard J., 3,926,034.

El Dorado, James H., to Midwest Mechanical Services, Inc. Industrial safety apparatus for disposing of welding fumes. 3,926,104, Cl. 98-115.0VM.

Electronic Arrays, Inc.: *See—*
Callahan, John, 3,927,334.

Electronor Corporation: *See—*
De Nora, Oronzio; Bianchi, Giuseppe; Nidola, Antonio; and Trisoglio, Giovanni, 3,926,751.

Eli Lilly and Company: *See—*
Koppel, Gary A., 3,926,978.
Lin, Tsung-Min, 3,927,212.
Miesel, John L., 3,927,020.

Ellicott Machine Corporation: *See—*
Turner, Thomas M.; and Scheid, Charles H., 3,926,050.

Ellin, Seymour, to Polaroid Corporation. Adapter for use with a packaged flashlamp array. 3,927,412, Cl. 354-143.000.

Elliott, Eugene R., to Culligan International Company. Control device. 3,926,071, Cl. 74-567.000.

Elliott, James Francis; and Johnson, Joel Swenum, to International Business Machines Corporation. Disk pack enclosure. 3,926,312, Cl. 206-444.000.

Elmis, Herbert: *See—*
Keller, Hans; and Elmis, Herbert, 3,927,335.

Eltro GmbH Gesellschaft fur Strahlungstechnik: *See—*
Beck, Gerhard; and Zeininger, Siegfried, 3,927,407.

Emcee Corporation: *See—*
Musgrove, Ronald R.; and Connelly, Lloyd E., 3,926,380.

Emmerichs, Heinz: *See—*
Heuel, Otto; and Emmerichs, Heinz, 3,927,301.

Enders, Edgar; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating animal acarid ectoparasites with -pheny liminopyrrolidines. 3,927,217, Cl. 424-274.000.

Enders, Max L. Self-locking vibration-proof lock washer and cooperating threaded fastener. 3,926,237, Cl. 151-34.000.

Endo, Hiroyuki: *See—*
Yoshikawa, Shinsuke; Endo, Hiroyuki; and Terasaki, Shuji, 3,927,156.

Engelhard, Helmut: *See—*
Saleck, Wilhelm; Engelhard, Helmut; Himmelmann, Wolfgang; Bentz, Francis; and Mader, Helmut, 3,926,635.

Engle, Edward Jacob, III, to Hercules Incorporated. Stabilized thermoset resins from poly(arylacetylenes). 3,926,907, Cl. 260-45.70P.

English, Jerome J., to Monsanto Company. Orifice structure for extruding molten metal to form fine diameter wire. 3,926,248, Cl. 164-273.00R.

Engwall, Bertil, to AB Svediesel. Work cabin for unhealthy environments. 3,926,250, Cl. 165-48.000.

Enokido, Nobuo; Murakami, Atsushi; Yamaguchi, Kazuo; Kanoh, Natsuki; Tanaka, Toru; Okano, Shigeaki; and Suzuki, Masatoshi, to Mitsubishi Chemical Industries, Ltd. Process for polymerization of olefin. 3,926,929, Cl. 260-85.30R.

Enomoto, Shigeo: *See—*
Moriyama, Itsuki; and Enomoto, Shigeo, 3,927,414.

Erickson, John W., to Kobe, Inc. Turbine. 3,926,534, Cl. 415-89.000.

Eriksson, Curt: *See—*
Leander, Leif; and Eriksson, Curt, 3,925,847.

Erlebach, Richard, to Gertsch AG. Ski boot. 3,925,911, Cl. 36-2.5AL.

Ermakova, Irina Nikolaevna: *See—*
Orlov, Petr Nikolaevich; Nesterov, Jury Ivanovich; Kudashov, Vasily Yakovlevich; Zimnyakov, Alexandr Vasilievich; Ermakova, Irina Nikolaevna; Bogomolov, Igor Vasilievich; Nirman, Efim Matveevich; and Sokolov, Vladimir Dmitrievich, 3,925,936.

Erodi, Judit: *See—*
Korbonits, Dezso; Harsanyi, Kalman; Molnar nee Bako, Erzsebet; Takacs, Kalman; Heja, Gergely; Bodnar, Janos; Bodrogi, Istvan; and Erodi, Judit, 3,927,025.

Ersfeld, Heinrich; Nadolski, Klaus; Schneider, Walter; Schulte, Klaus; and Boden, Heinrich, to Bayer Aktiengesellschaft. Injection nozzle for foaming machines. 3,926,219, Cl. 137-625.490.

ESB Incorporated: *See—*
Kelley, John Joseph; and Varker, Alan Edward, 3,926,886.

Eschle, Karl: *See—*
Huber-Emden, Helmut; Eschle, Karl; and Maeder, Arthur, 3,927,091.

Eskeli, Michael. Rotary heat exchanger. 3,926,010, Cl. 62-401.000.

Esselborn, Reiner: *See—*
Bernhard, Horst; Esselborn, Reiner; Hesse, Reiner; and Russmann, Horst, 3,926,659.

Esser, Heinz; and Boldt, Jurgen, to Bayer Aktiengesellschaft. Latex-resin mixtures. 3,926,880, Cl. 260-27.0BB.

Estes, John H.: *See—*
Wilson, Raymond F.; Peck, Reese A.; Estes, John H.; and Brandenburg, John T., 3,926,779.

Etablissements Boutrait-Morin: *See—*
Gourlet, Gaston, 3,926,205.

Etessam, Alexander Hossen. Gas generator. 3,925,981, Cl. 60-39.770.

Ethicon, Inc.: *See—*
Greenberg, Jonathan Fred; and Quade, Robert T., 3,926,194.

Ethyl Corporation: *See—*
Carpenter, Kenneth B., 3,926,466.
Gautreaux, Marcelian F., 3,926,580.
LaBorde, Joseph N., 3,925,953.
Plonsker, Larry, 3,926,581.

Etienne, Arlette Therese, to Centre de Recherches Metallurgiques. Refining process. 3,926,619, Cl. 75-60.000.

Etud: *See—*
Tanguy, Pierre, 3,926,414.

Eugene H. Clement, Hi-Gene Laundry Co.: *See—*
Mazeika, Albert J., 3,926,019.

Europatent S.A.: *See—*
Burgers, August, 3,925,934.

Evankovich, Peter P.; Madden, Robert J.; and Peterson, Edward M., to Anaconda Company, The. Fitting structure for tire rim. 3,926,241, Cl. 152-415.000.

Evans, Glenn A. Recliner chair. 3,926,472, Cl. 297-88.000.

Evans, Leo G.; and Ruthel, Walter W., to Hooker Chemicals & Plastics Corporation. Novel cathode fingers. 3,925,886, Cl. 29-628.000.

Evans, Robert T.; Cummins, Alonzo E.; and Anderson, Merlin F., to Halliburton Company. Down-hole pump and inflatable packer apparatus. 3,926,254, Cl. 166-106.000.

Evers, Heinz; and Knoch, Werner, to Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen m.b.H. Device for the continuous treatment of liquid streams. 3,926,807, Cl. 210-177.000.

Exxon Nuclear Company Inc.: *See—*
Rushworth, George E., 3,925,965.

Exxon Research & Engineering Co.: *See—*
Kuntz, Irving, 3,926,925.
Makowski, Henry S.; and Buckley, Donald J., Sr., 3,927,143.
Oswald, Alexis A.; and Valint, Paul L., Jr., 3,927,148.
Rossi, Albert; Jacobson, Norman; and Miller, Harold N., 3,926,579.
Wristers, Harry Jan; and Williams, Herschel Claude, 3,926,848.

F. D. Farnam Co.: *See—*
Farnam, Robert G., 3,926,445.

Fa. Planatolwerk Willy Hesselmann: *See—*
Wetzler, Josef; Neumann, Wilhelm; and Hesselman, Karlheinz, 3,926,712.

Fabrique Nationale Herstal S.A. en brege: *See—*
Gevers, Georges A., 3,925,902.

Facit Aktiebolag: *See—*
Andersson, Leif Helmer, 3,927,284.
Ljungberg, John Erik, 3,926,293.

Faessinger, Robert W.: *See—*
Edelson, Nathan Allen; and Faessinger, Robert W., 3,926,872.

Fairchild Industries, Inc.: *See—*
Earl, Webster B., 3,926,204.

Faisandier, Jacques. Hydraulic control circuit. 3,925,987, Cl. 60-464.000.

Falzone, John, to Raymond Lee Organization, Inc., The, a part interest. Flushometer device. 3,925,832, Cl. 4-249.000.

Farello, Giovanni: *See—*
De Santis, Sergio; Farello, Giovanni; and Torrani, Roberto, 3,926,354.

Farnam, Robert G., to F. D. Farnam Co. Convolutely wound gasket. 3,926,445, Cl. 277-204.000.

Farney, George K., to Varian Associates. Microwave tube using electronically tunable cavity resonator. 3,927,347, Cl. 315-39.550.

Farona, Michael F.; and White, James F., to University of Akron, The. Method for reacting organic halides. 3,926,950, Cl. 260-2.00H.

Fassbinder, Hans-Georg: *See—*
Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans-Georg, 3,926,618.

Fawcett, Sherwood L.; and Anno, James N., to Battelle Development Corporation. Method and apparatus for converting one form of energy into another form of energy. 3,927,329, Cl. 290-1.000.

Fayling, Richard E., to Minnesota Mining and Manufacturing Company. Magnetic record medium authentication system. 3,927,393, Cl. 340-149.00A.

Feagin, Frederick E.: *See—*
Genest, Leonard J.; Feagin, Frederick E.; Cole, Sylvan; and Messner, Daryle, 3,926,021.

Fedock, Michael P.: *See—*
Corbett, Paul M.; and Fedock, Michael P., 3,926,246.

Feldman, Rainer; Biethan, Uwe; Muller, Karl Adolf; and Panoch, Hans Joachim, to Chemische Werke Huls Aktiengesellschaft. Polyamide base powder coating material containing an aminoplast carrying alkoxyalkyl groups. 3,927,141, Cl. 260-849.000.

Feldmuhle Anlagen- und Produktions- gesellschaft mit beschrankter Haftung: *See—*
Lukowski, Heinz, 3,926,585.

Feldzamen, Alvin N. Apparatus for aiding the voluntary exercising of sphincter muscles. 3,926,178, Cl. 128-2.00S.

Fell, Ferol S.: *See—*
Goering, Lowell J.; and Fell, Ferol S., 3,925,971.

Fenerty, Michael J.; and Mustoe, David L., to Coors Porcelain Company. Composite seal ring and assembly. 3,926,443, Cl. 277-96.000.

Fergle, Richard Raymond: *See—*
Circle, Sidney Joseph; Fergle, Richard Raymond; Watkins, Leslie Ray; and Hooton, Daniel Edwards, 3,926,940.

Ferment, George R.: *See—*
Burns, Kenneth S.; Ferment, George R.; and Waugh, Roger C., 3,926,228.

Ferres, Harry; Kemmenoe, Adrian Victor; and Best, Desmond John, to Beecham Group Limited. Penicillins. 3,926,960, Cl. 260-239.100.

Ferri, Walter; and Grassotti, Giulio, to Officine Galileo S.p.A. Stereoplotting apparatus for air and earth photogrammetry. 3,925,897, Cl. 33-1.00A.

Ferrie, Ronald Gilbert, to RCA Corporation. Speaker muting system. 3,927,376, Cl. 325-478.000.

Ferrini, Pier Giorgio; Haas, Georges; and Rossi, Alberto, to Ciba-Geigy Corporation. Sulphamoylbenzoic acid amides. 3,926,961, Cl. 260-239.700.

Ferro Corporation: *See—*
Kaye, Saul, 3,926,644.

Fertig, Joseph: *See—*
Blank, Izhak; and Fertig, Joseph, 3,927,206.

Fiber Industries Inc.: *See—*
Vizurraga, Luis R., 3,927,052.

Fibers Controls Corporation: *See—*
Lytton, Kenneth G., 3,925,850.

Field, William E.: *See—*
Gerstenberger, Roland W.; and Field, William E., 3,926,424.

Figiel, Francis J.; and Anderson, Roland W., to Allied Chemical Corporation. Detergent solvent compositions. 3,926,862, Cl. 252-545.000.

Filen, Bjorn G. O., to AB Essve Produkter. Apparatus for separating, collecting and removing sulphuric acid fumes and the like from evacuation air. 3,926,598, Cl. 55-385.000.

Filsinger, John F.; and Mueller, Roger P., to Texmark, Incorporated. Printing ribbon advancing means. 3,926,109, Cl. 101-90.000.

Finegold, Hyman B.: *See—*
Reiger, Arthur C., Jr.; and Finegold, Hyman B., 3,926,421.

Finelli, Anthony F., to Goodyear Tire & Rubber Company, The. Polyurethanes chain-extended with 2,2'-diaminodiphenyldisulfide. 3,926,919, Cl. 260-75.0NH.

Finkbeiner, Herman L.; and Bush, John B., Jr., to General Electric Company. Anhydrides to improve oxidative coupling reactions. 3,927,077, Cl. 260-488.00R.

Firmenich S.A.: *See—*
Demole, Edouard P., 3,927,030.
Schulte-Elte, Karl-Heinrich; and Jindra, Henri, 3,927,107.

Firstenberg, Harold S. Buttons for attachment to push-button telephone keys. 3,927,282, Cl. 179-178.000.

Fisa, Bohuslav: *See—*
Marchessault, Robert H.; and Fisa, Bohuslav, 3,926,717.

Fischer, Dieter: *See—*
Bauser, Herbert; and Fischer, Dieter, 3,927,354.

Fischer, Hanspeter, to Ciba-Geigy Corporation. 2-Alkylthio-4,6-bis(substituted amino)-5-nitropyrimidines. 3,926,997, Cl. 260-256.50R.

Fischer & Porter Co.: *See—*
Seebode, Albert; Appel, Eggert; and Geisler, Gottfried, 3,926,049.

Fish, Leonard A.; Brodsky, Harvey A.; and Weitzel, Bruce A. Dial pulse detector and method. 3,927,264, Cl. 179-2.00A.

Fish, Vernon R. Accelerometer. 3,926,059, Cl. 73-510.000.

Fitton, Nigel S.: *See—*
Lear, Edward C.; and Fitton, Nigel S., 3,926,132.

Fjallbrant, Tore Torstensson, to Telefonaktiebolaget L M Ericsson. Demodulator. 3,927,378, Cl. 329-145.000.

Fjarlie, Earl John; Doyle, Thomas; and Teare, Melvin John, to RCA Corporation. Low noise wide band transducer system. 3,927,383, Cl. 330-59.000.

Flanagan, Thomas P.: *See—*
Georgoudis, Paul C.; Ray-Chaudhuri, Dilip K.; and Flanagan, Thomas P., 3,926,920.

Flavell, John; and Jeffcoat, Keith, to Courtaulds Limited. Knitting machines. 3,926,016, Cl. 66-157.000.

Fleck, Fritz; Schmid, Horst; and Valenti, Salvatore, to Sandoz Ltd. Triazole-bis(benzoxazole) optical brighteners. 3,926,969, Cl. 260-240.100.

Fleig, Helmut: *See—*
Hagen, Helmut; and Fleig, Helmut, 3,926,966.

Fleischman, Andor A., to Bell & Howell Company. Photographic objective. 3,926,504, Cl. 350-189.000.

Fluoroware, Inc.: *See—*
Wallestad, Victor C., 3,926,305.

FMC Corporation: *See—*
Kyrias, Gilbert M., 3,927,152.
Meadow, Morton; and Berkowitz, Sidney, 3,927,185.
Seldick, Jerome, 3,926,795.

Fogg, Sidney George; King, Peter Graham; and Yeoman, Elfed, to BP Chemicals International Limited. Process for isolating polychloroprene. 3,926,877, Cl. 260-23.70A.

Fohl, Artur. Inertia type switch having bridging ball contactor and plural, concentric conductive ring array. 3,927,286, Cl. 200-61.45R.

Foik, Adolf, to Gewerkschaft Eisenhutte Westfalia. Tunnel driving apparatus. 3,926,005, Cl. 61-85.000.

Foltier, Pierre, to Fonderies & Alteliers des Sablons. Mole traps. 3,925,922, Cl. 43-66.000.

Fonderies & Alteliers des Sablons: *See—*
Foltier, Pierre, 3,925,922.

Fong, William: *See—*
Broadway, Alexander Richard William; Fong, William; and Rawcliffe, Gordon Hindle, 3,927,358.

Ford Motor Company: *See—*
Cheung, Mo-Fung; and Dickie, Ray A., 3,926,888.
Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,926,772.
Ladd, Floyd N.; and Stacy, Donald G., 3,925,931.
Ladd, Floyd N.; and Stacy, Donald G., 3,925,932.
Ladd, Floyd N.; Raveschot, Marcel R.; and Stacy, Donald G., 3,926,066.
Mangels, John Anthony, 3,926,656.
Ulics, George, 3,926,469.

Forichon, Gaston, to Regie Nationale Des Usines Renault. Toggle-joint press. 3,926,033, Cl. 72-451.000.

Formall, Inc.: *See—*
McCall, John W., 3,926,303.

Forshaw, Sydney James: *See—*
Baines, Eric; Cropper, Edwin; and Forshaw, Sydney James, 3,927,201.

Forster, Siegmar; and Von Klipstein, Walrath, to Johannes Erhard, H. Waldenmaier Erben Suddeutsche Armaturenfabrik, Firma. Cock with shutoff member mounted eccentrically and rotatably in a housing. 3,926,407, Cl. 251-315.000.

Forsyth, Bruce Adam; and Pryor, David Ernest, to ICI Australia Limited. Salicylanilides. 3,927,071, Cl. 260-479.00R.

Foster, Larry R.; and Kuhn, Hans H., to Deering Milliken Research Corporation. Alkaline stable fugitive tints. 3,927,044, Cl. 260-394.000.

Fourier, Walter A.; and Dickmann, Daniel J., to M&T Chemicals Inc. Aqueous sealant compositions. 3,926,879, Cl. 260-27.00R.

Fox, Adrian Samuel, to Pennwalt Corporation. Fluorinated β-(alkoxy)-propionates. 3,927,072, Cl. 260-484.00R.

Fox, J. Eugene; and McChesney, James D., to Kansas University Endowment Association. Cytokinin-3-nucleoside compounds. 3,926,949, Cl. 260-211.50R.

Franc, Eugene K., to Construction Engineering Products. Tie Rod and seal assembly. 3,926,400, Cl. 249-40.000.

Francke, Wittko; and Heemann, Volker, to Amchem Products, Inc. Method for combating insects employing certain ketones. 3,927,207, Cl. 424-84.000.

Frank, Earl E., to Abex Corporation. Railroad car retarders. 3,926,124, Cl. 104-26.00A.

Frank, Edmund; and Polic, Edward F., to Packard Instrument Company, Inc. Method of and apparatus for vial transferring and changing. 3,926,323, Cl. 214-310.000.

Frank, Gunter: *See—*
Callies, Dieter; Frank, Gunter; and Graf vom Hagen, Siegbert, 3,926,557.

Franklin, Charles H.: *See—*
Vinton, Clarence S.; and Franklin, Charles H., 3,927,186.

Franklin, David M.; and Lane, William P., to Polaroid Corporation. Battery testing apparatus. 3,927,367, Cl. 324-29.500.

Franz Rubig & Sohne KG: *See—*
Ruebig, Herbert; and Ruebig, Helmut, 3,926,089.

Fraser, Robert W.: *See—*
Fustukian, David A. W.; Kushnir, Bud W.; Norris, Leon F.; and Fraser, Robert W., 3,926,691.

Freeman, Michael Alexander Reykers; and Swanson, Sydney Alan Vasey, to National Research Development Corporation. Endoprosthetic bone joint devices. 3,925,824, Cl. 3-1.912.

Frehn, Gunter, to W. Schlafhorst & Co. Weft storage device for warp knitting machines. 3,926,014, Cl. 66-84.00A.

Fretwell, Richard D., to MI^2. Programmable frequency-shift-keying acoustic transmitter to transmit repeated bit digital message via telephone lines. 3,927,263, Cl. 179-2.0DP.

Freudenschuss, Otto, to Vockenhuber, Karl; and Hauser, Raimund. Sound projector. 3,926,512, Cl. 352-25.000.

Frie, Wolfgang; Grave, Burghard; Strasser, Karl; and Gutbier, Heinrich, to Siemens Aktiengesellschaft. Battery comprising a plurality of cells. 3,926,676, Cl. 136-86.00R.

Friedrich, Ludwig: *See—*
Dengel, Ferdinand; Ehrmann, Oskar; Friedrich, Ludwig; and Zimmermann, Frank, 3,926,995.

Frisbee, Claude M.; and Baylor, John M., to J. I. Case Company. Power tilt dozer and reel carrier. 3,926,263, Cl. 172-801.000.

Frodsham, Vaughn D., to Huntington, Howard E. Spoon attachment for soda straw. 3,925,890, Cl. 30-141.000.

From, Anatoly Alexandrovich: *See—*
Ivanov, Mikhail Ivanovich; From, Anatoly Alexandrovich; Kiseley, Anatoly Efimovich; Nikitenko, Alexandr Alexandrovich; Rusanov, Valentin Mikhailovich; and Skobelev, Leonid Ivanovich, 3,926,939.

Frosch, Albert; and Korth, Hans Erdmann, to International Business Machines Corporation. Method of increasing the depth of focus and or the resolution of light microscopes by illuminating and imaging through a diaphragm with pinhole apertures. 3,926,500, Cl. 350-17.000.

Frost, Charles C.; and Weis, Siegfried K., to C. L. Frost & Son, Inc. Bearing housing assembly. 3,926,485, Cl. 308-193.000.

Frost, Louis H.; and Powers, Walter H., to L. H. Frost and Company, Inc. Multidirectional switch with universally pivot actuator for activating plural circuits. 3,927,285, Cl. 200-6.00A.

Froud, Roderick Wilson: *See—*
Lamb, Kenneth; and Froud, Roderick Wilson, 3,927,302.

Frystak, Richard: *See—*
Costanza, Carl C.; Weber, Walter W.; Betlejewski, Frank W.; and Frystak, Richard, 3,926,514.

Fuel Injection Development Corporation: *See—*
Leshner, Ervin; and Leshner, Michael D., 3,926,169.

Fuest, Ronald W., to Uniroyal, Inc. Method of rendering polyolefins dyeable with anionic dyes. 3,926,553, Cl. 8-169.000.

Fuga, Nobuhiko: *See—*
Watanabe, Yoshihisa; Imanari, Makoto; Nojiri, Naohiro; and Fuga, Nobuhiko, 3,926,915.

Fuji Electrochemical Co., Ltd.: *See—*
Tsuchida, Takashi; Shinoda, Kenichi; Yamamoto, Kohei; Murata, Tomoya; and Maeda, Yoshihiro, 3,926,678.

Fuji Photo Film Co., Ltd.: *See—*
Arai, Atsuaki; Oishi, Yasushi; Yamada, Minoru; Furutachi, Nobuo; and Nakamura, Kotaro, 3,926,631.
Honjo, Satoru, 3,926,628.
Horie, Ikutaro; Miyazako, Taksuhi; and Shimada, Takeo, 3,926,869.
Iwasa, Masakazu, 3,926,627.
Ogura, Shuichi; Chow, Hirotsura; and Kawamata, Toshio, 3,927,244.
Satomura, Masato, 3,927,133.
Sugizaki, Atsushi; Hirose, Takeshi; Yokota, Yukio; Okumura, Akio; Oishi, Yasushi; and Arai, Atsuaki, 3,926,634.

Fujikawa, Hisao: *See—*
Kowaka, Masamichi; and Fujikawa, Hisao, 3,926,620.

Fujimoto, Sakae, to Ricoh Co., Ltd. Variable-rate drive mechanism for a facsimile head or the like. 3,927,256, Cl. 178-7.600.

Fujimoto, Tsuneo: *See—*
Chibata, Ichiro; Ito, Hiroshi; Morimoto, Tomoaki; Taniguchi, Yukio; and Fujimoto, Tsuneo, 3,926,733.

Fujisawa, Tetsuo: *See—*
Ichikawa, Yoshihiro; Fujisawa, Tetsuo; and Seo, Yoshiro, 3,926,651.

Fujisawa, Yukio: *See—*
Kanzaki, Toshihiko; Fujisawa, Yukio; Shirafuji, Hideo; Nara, Kiyoshi; and Yoneda, Masahiko, 3,926,729.

Fujita, Yukio; Kawasaki, Iwao; and Nishikawa, Hideo, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Preparation of activated sludge and treatment of waste water therewith. 3,926,796, Cl. 210-11.000.

Fujiwara, Susumu; Okada, Takao; Koyama, Masao; Akashi, Hiromitsu; and Nishikawa, Yoichi, to Yokohama Rubber Company, Ltd., The. Signal level discrimination circuit. 3,927,309, Cl. 235-151.310.

Fukahori, Kentaro: *See—*
Yanagihara, Tadahisa; and Fukahori, Kentaro, 3,927,134.

Fukami, Sigetosi: *See—*
Ichikawa, Tomomichi; and Fukami, Sigetosi, 3,927,047.

Fukuba, Kozo; Ogushi, Yasutomo; and Miyazaki, Minematsu, to Sumitomo Chemical Company, Ltd. Process for preparing amide polyphosphates. 3,926,990, Cl. 260-249.600.

Fukuda, Hideo: *See—*
Nara, Kiyoshi; Ohta, Kazuhiko; Katamoto, Kazuyoshi; Mizokami, Nariakira; and Fukuda, Hideo, 3,926,973.

Fukuda, Masaaki: *See—*
Yoshino, Takehiko; Yanagimachi, Akio; Uehara, Takashi; Takezawa, Teruhiro; Fukuda, Masaaki; and Kayano, Tatsuo, 3,927,269.

Fukushima, Mitio; and Iwanami, Teruo, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Flame-resistant resinous molding. 3,926,876, Cl. 260-23.00R.

Fukuyama, Kunihiko: *See—*
Nakamura, Kenji; Fukuyama, Kunihiko; and Yamamoto, Takuo, 3,927,279.

Furr, Robert L.; and Hayes, Robert I., Jr. Table soccer or football game structure. 3,926,432, Cl. 273-85.00D.

Furst, Andor; Buchschacher, Paul; Kagi, Dieter; Meier, Werner; Muller, Marcel; and Widmer, Erich, to Hoffmann-La Roche Inc. Intermediates for benzindenes. 3,927,032, Cl. 260-340.900.

Furuhashi, Tokio, to Nippon Electric Company, Ltd. Electronic circuit comprising complementary symmetrical transistors. 3,927,333, Cl. 307-255.000.

Furutachi, Nobuo: *See—*
Arai, Atsuaki; Oishi, Yasushi; Yamada, Minoru; Furutachi, Nobuo; and Nakamura, Kotaro, 3,926,631.

Furuya Kogyo Kabushiki Gaisha: *See—*
Furuya, Toshitsugu, 3,925,860.

Furuya, Toshitsugu, to Furuya Kogyo Kabushiki Gaisha. Snap button. 3,925,860, Cl. 24-208.00A.

Fustukian, David A. W.; Kushnir, Bud W.; Norris, Leon F.; and Fraser, Robert W., to Sherritt Gordon Mines Limited. Dispersion strengthened metals and alloys. 3,926,691, Cl. 148-32.000.

Futch, Max Gerald. Apparatus for use in assembling food on trays. 3,926,489, Cl. 312-250.000.

Fuzzell, Joe E., to Caterpillar Tractor Co. Bi-level condition monitor using reverse-biased control diodes. 3,927,399, Cl. 340-248.00D.

G. D. Searle & Co.: *See—*
Lenz, George R., 3,926,962.

G.D. Societa in Accomandita Semplice di Enzo Seragnoli e Ariosto Seragnoli: *See—*
Seragnoli, Ariosto, deceased; Seragnoli, Leonina Ricci, heir and legal representative; Seragnoli, Giorgio, heir and legal representative; and Seragnoli, Daniela, heir and legal representative, 3,926,300.

Gabriel, Lester H.; and Willis, Wilfred Ernest, to Gabriel-Willis Associates. Altering the properties of concrete by altering the quality or geometry of the intergranular contact of filler materials. 3,927,163, Cl. 264-71.000.

Gabriel-Willis Associates: *See—*
Gabriel, Lester H.; and Willis, Wilfred Ernest, 3,927,163.

Gabureanu, Mircea: *See—*
Constantinescu, Petre; Hristea, Nicolae; Blebea, Speranta; Hristea, Ieronim; Huniadi, Mihai; and Gabureanu, Mircea, 3,925,928.

Gaeckel, Bruno L.; and Larsen, Hans R., to Union Carbide Canada Limited. Flame resistant polyolefins. 3,927,145, Cl. 260-897.00B.

Gaeng, Manfred: *See—*
Dimroth, Peter; Gaeng, Manfred; and Ruider, Guenther, 3,926,943.

Gaertner, Van R., to Monsanto Company. Process for producing N-phosphonomethyl glycine. 3,927,080, Cl. 260-502.500.

GAF Corporation: *See—*
Roberts, Stiles M.; and Stanley, Lester N., 3,926,945.

Gail, Josef; and Kauferle, Josef. Barrier device. 3,925,930, Cl. 49-124.000.

Gale, Laird H., to Shell Oil Company. Catalytic cracking of paraffinic naphtha. 3,926,781, Cl. 208-117.000.

Gale, Robert M.: *See—*
Baker, Richard W.; and Gale, Robert M., 3,926,188.

Gallagher, James A.; and Brizgys, Bernardas, to BASF Wyandotte Corporation. Monomercury organo catalyst. 3,927,053, Cl. 260-433.000.

Ganslaw, Stuart H.: *See—*
Micchelli, Albert L.; Legato, Gerard J.; Ganslaw, Stuart H.; and Schuler, Lawrence D., 3,927,199.

Garbuio, Carlo. Foot-fitting insert for ski boot or the like. 3,925,916, Cl. 36-71.000.

Garcia, Paulina P.: *See—*
Borror, Alan L.; Hill, Ruth Linda; and Garcia, Paulina P., 3,926,971.

Garfinkel, Marvin: *See—*
Cordes, Linus F.; and Garfinkel, Marvin, 3,927,225.

Garnett, Lawrence Taylor, to International Telephone & Telegraph Corporation. Mechanical span and zero adjustment apparatus for pressure transducers. 3,926,055, Cl. 73-398.0AR.

Garofano, Norman R.; and Port, Eugene B., to Allied Chemical Corporation. Purification of carbonate process solutions. 3,927,175, Cl. 423-206.000.

Garshelis, Ivan J. Method and apparatus for circularly magnetizing a helical conductive rod. 3,927,386, Cl. 335-284.000.

Gaston County Dyeing Machine Company: *See—*
Zeiffer, Dieter F., 3,925,905.

Gates, Francis J.: *See—*
Pembrook, John D.; Burch, Darrell E.; and Gates, Francis J., 3,926,527.

Gates Rubber Company, The: *See—*
Cone, Irwin C., 3,925,844.
Vorih, William J., 3,926,238.

Gaudet, Ronald M.; Michell, Samuel S.; and Kozy, Michael J., to Schroeder Brothers Corporation. No-bypass filter system. 3,926,806, Cl. 210-137.000.

Gautreaux, Marcelian F., to Ethyl Corporation. Fuel compositions and additive mixtures for alleviation of exhaust gas catalyst plugging. 3,926,580, Cl. 44-68.000.

Gay, Larry T., to C-G Process Coal Company. Method and apparatus for reducing sulphur and ash content of coal. 3,926,787, Cl. 209-3.000.

Gay, Pierre, to Creusot-Loire Enterprises. Apparatus adapted for driving or braking a metallic band. 3,926,353, Cl. 226-95.000.

Gaz de France: *See—*
Marrast, Jacques; Minssieux, Louis; and Blondin, Eric, 3,926,257.

Geen, Wesley C., to Reliance Brooks, Inc. Steam trap temperature indicating arrangement. 3,926,368, Cl. 236-41.000.

Gehl, Fred J. Penis encircling device. 3,926,184, Cl. 128-79.000.
Geiger, Kenneth Daniel; Horvath, Steven Joseph; Kallay, Victor Paul; Seymour, Theodore Joseph; Watson, Thorpe Wesley; and Zervoudis, John, to Cominco Ltd. Lead sheet casting machine. 3,926,247, Cl. 164-263.000.
Geisler, Gottfried: *See—*
Seebode, Albert; Appel, Eggert; and Geisler, Gottfried, 3,926,049.
Geller, Ehud, to Ives Laboratories Inc. Tablet formulation. 3,927,194, Cl. 424-15.000.
Gendrot, Andre Jean-Claude; and Chartrin, Jean Lucien Yves. Method and device for synchronizing the displacements of two moving bodies. 3,926,511, Cl. 352-5.000.
General Dynamics Corporation: *See—*
Lessman, Gerhard, 3,927,254.
General Electric Company: *See—*
Carter, Ralph E., 3,927,154.
Cordes, Linus F.; and Garfinkel, Marvin, 3,927,225.
Davidson, William E., 3,926,392.
Finkbeiner, Herman L.; and Bush, John B., Jr., 3,927,077.
Giaever, Ivar, 3,926,564.
Hester, William F., 3,926,358.
Konrad, Charles Edward, 3,927,357.
Laessig, Rudolf R., 3,926,150.
Mark, Victor, 3,926,908.
Niedrach, Leonard W.; and Stoddard, William H., Jr., 3,926,766.
Sasnett, Russell M., 3,926,486.
Taylor, Dale F.; and Siwek, Erwin G., 3,926,670.
Winchell, Harry S.; and Lewis, Robert E., 3,926,176.
Ziegler, Walter Herbert, 3,925,979.
General Foods Corporation: *See—*
Dykes, Ralph E.; and Mitchell, Robert M., 3,925,959.
Kalafatas, Nicholas J.; Rosenthal, Harold; and Consolazio, George A., 3,927,221.
General Latex and Chemical Corporation: *See—*
Hopkins, Henry S., Jr.; and Gordon, Philip L., 3,926,700.
General Motors Corporation: *See—*
Abu-Isa, Ismat A., 3,926,932.
Bernard, James A., 3,926,315.
Braden, Ralph S.; Pugh, Cecil C.; and Rigg, Ralph R., 3,926,007.
Brewster, Roger F., 3,927,362.
Burns, Ronald N.; Landwehr, Dewayne A.; Schroeder, Roger H.; Vogelei, Robert A.; and Zeller, Gary P., 3,926,462.
Chen, Stephen S., 3,927,359.
Gruhl, Frederick, 3,927,305.
Kanaby, Randel R., 3,926,245.
Landwehr, DeWayne A.; and Zeller, Gary P., 3,926,463.
Mathues, Thomas P., 3,926,476.
McIntosh, Duane E., 3,927,401.
Genest, Leonard J.; Feagin, Frederick E.; Cole, Sylvan; and Messner, Daryle, to Monitron Industries, Inc. Electronic combination lock and system. 3,926,021, Cl. 70-278.000.
Gentry, William O., to United States of America, Energy Research and Development Administration. System for detecting gaseous contaminants in air. 3,926,560, Cl. 23-254.00E.
Georg Spellmann Hannov.-Holz-Industrie: *See—*
Reuter, Manfred, 3,925,933.
George A. Goulston Company: *See—*
Cohen, Norman R.; and Syrmopoulos, Demosthenes S., 3,926,816.
Georgoudis, Paul C.; Ray-Chaudhuri, Dilip K.; and Flanagan, Thomas P., to National Starch and Chemical Corporation. Hot melt adhesive based on low viscosity heat stable copolyesters. 3,926,920, Cl. 260-75.00R.
Geoscience Ltd.: *See—*
Sabin, Cullen M., 3,926,139.
Gerecht, John Fred, to Colgate-Palmolive Company. Detergent compositions containing amine oxides. 3,926,861, Cl. 252-542.000.
Geren, Lorenzo Dow: *See—*
Greenawalt, Eddie Lee; and Geren, Lorenzo Dow, 3,925,963.
Germann, Richard Paul: *See—*
Crovetti, Aldo Joseph; Blank, Artur; and Germann, Richard Paul, 3,927,100.
Gerstenberger, Roland W.; and Field, William E., to Jensen Corporation. Folding apparatus. 3,926,424, Cl. 270-62.000.
Gertsch AG: *See—*
Erlebach, Richard, 3,925,911.
Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen m.b.H.: *See—*
Evers, Heinz; and Knoch, Werner, 3,926,807.
Gevers, Georges A., to Fabrique Nationale Herstal S.A. en brege. Adjustable sight for fire-arms. 3,925,902, Cl. 33-257.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Foik, Adolf, 3,926,005.
Harmsma, Guenter; Rosenberg, Harry; Laabs, Johannes; and Becker, Kunibert, 3,925,995.
Giaever, Ivar, to General Electric Company. Substrate for immunological tests and method of fabrication thereof. 3,926,564, Cl. 23-259.000.
Gibellina, Michael C., to Airwick Industries, Inc. Pool cleaning apparatus. 3,926,667, Cl. 134-167.00R.
Gigou, Claude; and Quentin, Jean-Pierre, to Rhone-Poulenc, S.A. Separation apparatus using ultrafiltration. 3,926,797, Cl. 210-22.000.
Gilbert, Eugene C.; Jones, Robert E.; McLean, Donald C.; and Sherman, Edward, to Quaker Oats Company, The. Preparation of tetrachlorocyclo-hexanone. 3,927,106, Cl. 260-586.00R.
Gilbert, Horace E.: *See—*
Abney, Dave L.; Williams, Robert C.; and Gilbert, Horace E., 3,926,409.
Gillies, Barrie Andrew; and Simpson, Frederick Granville, to Sperry Rand Limited. Gyroscopic apparatus. 3,926,060, Cl. 74-5.100.
Gilpatrick, Michael William, to Deering Milliken Research Corporation. Loop pile fabric cutting apparatus with selvedge protector. 3,925,864, Cl. 26-9.000.
Ginzel, Byron E. Blood collecting and processing means. 3,926,521, Cl. 356-39.000.
Girotra, Narindar N.; and Wendler, Norman L., to Merck & Co., Inc. Phthalimido derivatives and processes. 3,926,965, Cl. 260-240.00R.
Gist-Brocades N.V.: *See—*
Vos, Cornelis; and Admirant, Jacobus Den, 3,927,211.
Givaudan Corporation: *See—*
Lamparsky, Dietmar; and Calame, Jean-Pierre, 3,926,859.
Glaeser, Hans Hellmut, to Du Pont de Nemours, E. I., and Company. Ilmenite beneficiation with $FeCl_3$. 3,926,614, Cl. 75-1.000.
Glancy, Walter P. Energy recovery system. 3,926,249, Cl. 165-3.000.
Glaser, Heinz; and Zlatareff, Vassil, to Societe d'Etudes du Procede NORIDEM. Use of temporary printing carriers. 3,926,707, Cl. 156-239.000.
Glass Container Manufacturers Institute, Inc.: *See—*
Smay, Gary Lynn; Van Caporali, Ronald; and Southwick, Russell Duty, 3,926,604.
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.: *See—*
Smith, Gordon C., 3,926,302.
Glaxo Laboratories Limited: *See—*
Barton, Derek Harold Richard; Underwood, William George Elphinstone; Looker, Brian Edgar; and Hewitt, Graham, 3,927,013.
Gregson, Michael; Cook, Martin Christopher; and Gregory, Gordon Ian, 3,926,957.
Globe Manufacturing Co.: *See—*
Wei, Peter, 3,926,909.
Globe Tool and Engineering Company, The: *See—*
Reiger, Arthur C., Jr.; and Finegold, Hyman B., 3,926,421.
Glory Kogyo Kabushiki Kaisha: *See—*
Ushio, Masatoshi, 3,925,966.
Glover, Fay W.: *See—*
Schlenker, Harold Oscar; and Glover, Fay W., 3,926,532.
Glover, George M., to Starkey, Caroline J. Fruit picking apparatus. 3,925,973, Cl. 56-328.00R.
Gluecksman, Alfred: *See—*
Marans, Nelson S.; and Gluecksman, Alfred, 3,926,755.
Gobel, Wilhelm: *See—*
Mayer-Mader, Rudolf; and Gobel, Wilhelm, 3,926,912.
Gobran, Ramsis, to Minnesota Mining and Manufacturing Company. Flexible strip coated with a pressure-sensitive adhesive composition tackified with phenol-diene-phenol resin adduct. 3,927,239, Cl. 428-355.000.
Goddard, Clarence C. Sewage treatment system. 3,926,808, Cl. 210-195.000.
Goeckel, Helmut, to Neckermann Versand KGaA. Headset for reproducing quadraphonically recorded information. 3,927,262, Cl. 179-1.0GQ.
Goering, Lowell J.; and Fell, Ferol S., to Hesston Corporation. Gauging apparatus for implement head. 3,925,971, Cl. 56-208.000.
Goines, John A. Industrial bucket improvement. 3,926,452, Cl. 280-79.200.
Goldstein, Irving S., to Xerox Corporation. RF sputtering of trigonal selenium films. 3,926,762, Cl. 204-192.000.
Golitz, Hans Dietrich, deceased (by Golitz, Ingrid Irene Klarchen, heiress); Wagner, Kuno; Quiring, Bernd; and Noll, Walter, to Bayer Aktiengesellschaft. Alkoxysilyl-substituted epoxidized urea derivatives. 3,927,042, Cl. 260-348.0SC.
Golitz, Ingrid Irene Klarchen, heiress: *See—*
Golitz, Hans Dietrich, deceased; Wagner, Kuno; Quiring, Bernd; and Noll, Walter, 3,927,042.
Golubenko, Mikhail Afanasievich: *See—*
Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovidh; Zakharova, Nina Vasilievna; Golubenko, Mikhail Afanasievich; Tolstikov, Genrikh Alexandrovich; Kholodovskaya, Rakhil Samoilovna; Shalimova, Zoya Stepanovna; Legostaeva, Taisia Vasilievna; Popov, Vasily Dmitrievich; and Dolidze, Vladimir Romanovich, 3,927,038.
Gondo, Hisashi; Eguchi, Naoki; Yoshimura, Takafumi; and Araki, Masaki, to Nippon Steel Corporation. Method for producing a killed steel wire rod. 3,926,687, Cl. 148-12.00B.
Good, Lewis B., Jr. Golf exerciser device. 3,926,430, Cl. 272-79.00C.
Goodyear Aerospace Corporation: *See—*
Crossman, Richard L., 3,926,283.
Lovich, John W.; Meller, Oscar W.; and Sprick, Walter F., 3,926,243.
Ruof, Edgar J., 3,926,478.
Goodyear Tire & Rubber Company, The: *See—*
Bryson, Jay G., 3,927,137.
Burkholder, Ward J., 3,927,124.
Finelli, Anthony F., 3,926,919.
Hollingshead, William S., 3,927,099.
Mowdood, Syed K., 3,926,910.
Sharp, William J., Jr., 3,926,704.
Stalter, Robert J., Sr., 3,927,162.
Wolfe, Merritt W., 3,926,711.

Goralski, Christian T.; and Klingler, Thomas C., to Dow Chemical Company, The. 1,1-Dihalo-1-(methylsufonyl)methanesulfonamides. 3,927,090, Cl. 260-556.00A.

Gordon, Philip L.: *See*—
Hopkins, Henry S., Jr.; and Gordon, Philip L., 3,926,700.

Goren, Mayer B.; and Coltrinari, Enzo L., to Hazen Research, Inc. Ion exchange process for the recovery of copper. 3,927,169, Cl. 423-24.000.

Gosser, Lawrence Wayne, to Du Pont de Nemours, E. I., and Company. Hydrido(nitrile)tris(triaryl phosphite)cobalt complexes. 3,927,056, Cl. 260-439.00R.

Gostling, Peter Eric, to C. Evans & Sons Limited. Builders scaffolding. 3,926,531, Cl. 403-293.000.

Gotsmann, Ulrich: *See*—
Meyer, Artur; Gotsmann, Ulrich; and Meyer, Ernst, 3,927,012.

Goulay, Jean: *See*—
Vairel, Edmond G.; Goulay, Jean; and Choay, Jean, 3,926,727.

Gould, Robert E.: *See*—
Weingrad, Saul; Wahl, Albert J.; Mucha, Richard C.; and Gould, Robert E., 3,926,710.

Gounou, Jean Marie Joseph Elie: *See*—
Humbert, Jean Jacques; Thomas, Jean Pierre Francis; Brut, Gerard Yvan; and Gounou, Jean Marie Joseph Elie, 3,926,697.

Gourlet, Gaston, to Etablissements Boutrait-Morin. Quick coupling connectors. 3,926,205, Cl. 137-223.000.

Graco Inc.: *See*—
Siczek, Bernard, 3,926,376.

Graf vom Hagen, Siegbert: *See*—
Callies, Dieter; Frank, Gunter; and Graf vom Hagen, Siegbert, 3,926,557.

Graff, Eugene A., to Westinghouse Electric Corporation. Method for the preparation of europium activated yttrium oxysulfide. 3,926,837, Cl. 252-301.40S.

Graham, Boynton; and Ingersoll, H. Gilbert, to Du Pont de Nemours, E. I., and Company. Magnetic tape binder from a polyurethane, a polyol and an isocyanate. 3,926,826, Cl. 252-62.540.

Graham, Robert H.; and Sanders, Duane, to R. A. Pearson Company. Escapement mechanism for case packing machines. 3,926,336, Cl. 221-296.000.

Grane, Henry R.; and Zak, Thomas S., to Atlantic Richfield Company. Preparation of phenyl methyl carbinol. 3,927,120, Cl. 260-618.00H.

Grane, Henry R.; and Zak, Thomas S., to Atlantic Richfield Company. Phenyl methyl carbinol manufacture by hydrogenation of acetophenone. 3,927,121, Cl. 260-618.00H.

Grant, Norman H.; and Sarantakis, Dimitrios, to American Home Products Corporation. Polymeric somatostatin. 3,926,937, Cl. 260-112.500.

Grassotti, Giulio: *See*—
Ferri, Walter; and Grassotti, Giulio, 3,925,897.

Grau, Hermann. Safety closure. 3,926,326, Cl. 215-218.000.

Grave, Burghard: *See*—
Frie, Wolfgang; Grave, Burghard; Strasser, Karl; and Gutbier, Heinrich, 3,926,676.

Gray, Don N.; Keyes, Melvin H.; and Semersky, Frank E., to Owens-Illinois, Inc. Urea analysis. 3,926,734, Cl. 195-103.50R.

Gray, James H. Method and apparatus for scrubbing the ends and sides of a motor vehicle. 3,926,663, Cl. 134-6.000.

Graybill, Howard W.: *See*—
Tahiliani, Vasu H.; and Graybill, Howard W., 3,927,246.

Greber, Gerd; Darms, Roland; and Lohmann, Dieter, to Ciba-Geigy Corporation. Crosslinked polymers containing siloxane groups. 3,926,911, Cl. 260-46.50E.

Green, Frederic L.: *See*—
Allen, James H.; and Green, Frederic L., 3,926,175.

Green, Howard; and Rheinwald, James G., to Massachusetts Institute of Technology. Method of controllably releasing glucose to a cell culture medium. 3,926,723, Cl. 195-1.800.

Green, Howard E.: *See*—
Jones, Robert J.; and Green, Howard E., 3,927,027.

Greenawalt, Eddie Lee; and Geren, Lorenzo Dow, to Dow Chemical Company, The. Form, fill and seal industrial bag machine. 3,925,963, Cl. 53-182.000.

Greenberg, Jonathan Fred; and Quade, Robert T., to Ethicon, Inc. Sutures with reduced diameter at suture tip. 3,926,194, Cl. 128-339.000.

Greenwood, Robert C.: *See*—
Burke, William F.; Crowell, Lee T.; Greenwood, Robert C.; and Jones, Thomas E., 3,926,291.

Greer, Philip A. Knock-down drawer assembly. 3,926,491, Cl. 312-330.00R.

Gregory, Gordon Ian: *See*—
Gregson, Michael; Cook, Martin Christopher; and Gregory, Gordon Ian, 3,926,957.

Gregson, Michael; Cook, Martin Christopher; and Gregory, Gordon Ian, to Glaxo Laboratories Limited. Penicillin antibiotics. 3,926,957, Cl. 260-239.100.

Gremmelspacher, Max: *See*—
Bleier, Waldemar; and Gremmelspacher, Max, 3,926,195.

Grenda, David W.: *See*—
Horn, Richard E.; and Grenda, David W., 3,926,759.

Grenier, Bernard J. Steam engine. 3,926,540, Cl. 418-197.000.

Griffin, Anselm C., Jr.; and Watson, Harold, to United States of America, Agriculture. Fluid impact gin. 3,925,849, Cl. 19-48.000.

Griffis, Steven W. Computerized organ registration affecting system. 3,926,087, Cl. 84-345.000.

Grinev, Alexei Nikolaevich; Shvedov, Vasily Ivanovich; Sytina, Evgenia Nikolaevna; Bogdanova, Nadezhda Sergeevna; Nikolaeva, Irina Sergeevna; Pershin, Grigory Nikolaevich; and Guskova, Tatyana Anatolievna. Method of preparing 2,4,6-triiodoresorcinol. 3,927,125, Cl. 260-623.00H.

Gripe, William B.; and Norman, Melvin H., to Amot Controls Corporation. Seal ring. 3,926,444, Cl. 277-177.000.

Gritzner, Gerhard, to Dow Chemical Company, The. Diaphragm cell chlorine production. 3,926,769, Cl. 204-237.000.

Grochol, Jan; and Meier, Werner, to Sulzer Brothers Limited. Noncorrosive regular packing member and a method of making same. 3,927,165, Cl. 264-129.000.

Grolman, Bernard: *See*—
Richards, William; and Grolman, Bernard, 3,925,825.

Gross, James R.; and McFadden, Russell T., to Dow Chemical Company, The. Method for making a crosslinkable aqueous solution which is useful to form soft, water-swellable polyacrylate articles. 3,926,891, Cl. 260-29.60E.

Gross, Robert A., to United States of America, Air Force. Shock heated, wall confined fusion power system. 3,925,990, Cl. 60-644.000.

Gruhl, Frederick, to General Motors Corporation. Fuel economy indicator having range selected filters. 3,927,305, Cl. 235-150.210.

Grunenwald, Karl, to Binz & Co. Method of and device for disinfecting the air extracted from the isolated interior of an ambulance. 3,926,099, Cl. 98-2.050.

GTE Automatic Electric Laboratories Incorporated: *See*—
Bertellotti, Ansano, 3,926,490.
Stewart, James A.; and Zellmer, Neale A., 3,927,266.

GTE Laboratories Incorporated: *See*—
Auborn, James J., 3,926,669.

GTE Sylvania Incorporated: *See*—
Chenot, Charles F., 3,927,180.
Hammond, Michael J.; and Herner, Raymond F., 3,927,240.

Cuala, Piergiacomo, to Angelo Guala di Piergiacomo e Roberto Guala & C. S.A.S. Stopper of plastics having an expansible portion for bottles for sparkling wines and the like. 3,926,329, Cl. 215-361.000.

Gudernatsch, Hugo; Jaekel, Gerhart; Kroll, Wolfgang; Oden, Volker; and Reinhardt, Konrad, to Hoechst Aktiengesellschaft. Apparatus for the aeration of effluent with oxygen-containing gas. 3,926,810, Cl. 210-220.000.

Guenst, William C., Jr.; and Litschi, Gerold, to W. R. Grace & Co. Plate conveying apparatus. 3,926,297, Cl. 198-19.000.

Guetens, Edward G., to Atlantic Richfield Company. Production of hydroperoxides. 3,927,115, Cl. 260-610.00B.

Gueussier, Andre; Tricot, Roland; and Lefevre, Jean. Semi-ferritic stainless manganese steel. 3,926,685, Cl. 148-12.0EA.

Guilbault, Lawrence James; and Zakrzewski, James Richard, to Calgon Corporation. Process of improving water drainage from paper webs by addition of a water soluble block polymer to a cellulosic pulp slurry. 3,926,718, Cl. 162-168.000.

Guild, William H. Ski binding apparatus. 3,926,451, Cl. 280-11.35C.

Guinosso, Charles J.: *See*—
Teller, Daniel M.; Sellstedt, John H.; and Guinosso, Charles J., 3,926,984.

Gujer, Henri, to Diplomat AG. Self-cleaning electrically ignited lighter. 3,926,545, Cl. 431-122.000.

Gulf Oil Corporation: *See*—
Roth, Clarence Edward, Jr.; Hughes, Robert L.; and Thompson, Kenneth F. (said Clarence Edward Roth and Robert L. Hughes assors. to), 3,927,245.

Gulf Research & Development Co.: *See*—
Christman, Robert D.; and Yanik, Stephen J., 3,926,784.
Lasswell, Joseph A.; and Brown, Francis E., 3,926,934.

Gunther, Friedrich Wilhelm: *See*—
Scharfenberg, Walter Ernst Gustav; and Gunther, Friedrich Wilhelm, 3,926,317.

Gupta, Shanti S.; and Pershing, Robert G., to Wescom, Inc. Negative impedance repeater. 3,927,280, Cl. 179-170.00G.

Gurgiolo, Arthur E.: *See*—
Quock, Billy; Kelley, Don Howard; Warneke, Sehon Lester; and Gurgiolo, Arthur E., 3,926,867.

Gurney, Ferdinand J.: *See*—
Abson, David J.; and Gurney, Ferdinand J., 3,926,029.

Guskova, Tatyana Anatolievna: *See*—
Grinev, Alexei Nikolaevich; Shvedov, Vasily Ivanovich; Sytina, Evgenia Nikolaevna; Bogdanova, Nadezhda Sergeevna; Nikolaeva, Irina Sergeevna; Pershin, Grigory Nikolaevich; and Guskova, Tatyana Anatolievna, 3,927,125.

Gutbier, Heinrich: *See*—
Frie, Wolfgang; Grave, Burghard; Strasser, Karl; and Gutbier, Heinrich, 3,926,676.

Gutjahr, Manfred A.; Schmid, Rudolf; and Beccu, Klaus D., to Battelle Memorial Institute. Method of manufacturing positive nickel hydroxide electrodes. 3,926,671, Cl. 136-29.000.

Gutner, Kenneth H. Drawer slide assembly. 3,926,492, Cl. 312-348.000.

Guttulsrud, Per. Ski bindings. 3,926,450, Cl. 280-11.35B.

Guzy, Raymond L.; and Sheth, Rajesh N., to Borg-Warner Corporation. Oil-resistant blends for electrical insulation. 3,926,900, Cl. 260-33.6AQ.

Gysling, Henry L., to Eastman Kodak Company. Photosensitive copper (I) complexes. 3,927,055, Cl. 260-438.100.

H. Gertsch & Co. Aktiengesellschaft: *See*—
Rudin, Ernst; and Weisskopf, Heinz, 3,926,599.

H. R. Turner (Willenhall) Limited: *See—*
Johndrow, John Paul; and Pallant, Joseph, 3,926,474.
H. W. Wallace & Company, Limited: *See—*
More, Arthur Rowlatt; and Whittington, Robert John, 3,926,042.
Haas, Georges: *See—*
Ferrini, Pier Giorgio; Haas, Georges; and Rossi, Alberto, 3,926,961.
Haase, Elmer A.; and Kirwin, James M., to Bendix Corporation, The. Fuel control apparatus. 3,926,162, Cl. 123-139.00A.
Habasko, Werner; and Syrovatka, Rudolf, to Lever Brothers Company. Anti-caking composition. 3,926,841, Cl. 252-383.000.
Habiby, Emile Najib, to Lubrizol Corporation, The. Novel sulfur-containing compositions. 3,926,822, Cl. 252-48.600.
Haddad, Ihsan A., to Instrumentation Laboratory, Inc. Electrochemical electrode structure. 3,926,765, Cl. 204-195.00F.
Hafskjold, Petter Sigvardt, to Ingenior F. Selmer A/S. Breakwater device for offshore submerged foundation structures. 3,925,997, Cl. 61-46.500.
Hage, Jacob M., to Midwest Chrome Process Company. Multiple metallic layers including tin-cobalt-containing alloy layer. 3,926,569, Cl. 29-194.000.
Hagel, John Louis; Pape, Robert Carl; and Reinwall, Ernest William, Jr., to Illinois Tool Works Inc. Panel support and attachment system. 3,925,952, Cl. 52-714.000.
Hagen, Helmut; and Fleig, Helmut, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. 5-Nitrofuran compounds. 3,926,966, Cl. 260-240.00A.
Hagmann, Mark J.: *See—*
Cook, Melvin A.; and Hagmann, Mark J., 3,926,698.
Hahn, Helmut: *See—*
Rebsdat, Siegfried; and Hahn, Helmut, 3,926,989.
Hajos, Zoltan George, to Hoffmann-La Roche Inc. Stereospecific total steroidal synthesis via substituted C/D-trans indanones. 3,927,031, Cl. 260-340.900.
Haldor Topsoe A/S: *See—*
Rostrup-Nielsen, Jens Richard, 3,926,583.
Hall, Garth O.; and Unangst, Paul H., to Universal Oil Products Company. Locking mechanism for pedestal seat. 3,926,396, Cl. 248-418.000.
Hall, John B.; Lala, Lekhu Kewalram; Beets, Muus G. J.; and Taylor, William I., to International Flavors & Fragrances Inc. Bicyclic compounds and processes for making and using same. 3,927,083, Cl. 252-522.000.
Hall, John B.: *See—*
Wiegers, Wilhelmus J.; and Hall, John B., 3,927,109.
Halliburton Company: *See—*
Evans, Robert T.; Cummins, Alonzo E.; and Anderson, Merlin F., 3,926,254.
Hallsenius, Carlgustaf, Administrator: *See—*
Pulk, Elgas, deceased; Hallsenius, Carlgustaf, Administrator; and Noren, John Paul, 3,926,345.
Hama, Hiroyuki, to Olympus Optical Co., Ltd. Device for directing light to illuminating fiber optical system. 3,926,501, Cl. 350-96.00B.
Hamamoto, Kazuko: *See—*
Kondo, Shinichi; Sezaki, Masaji; Koike, Makiko; Shimura, Masaru; Akita, Eiichi; Satoh, Kimio; Hamamoto, Kazuko; Niida, Taro; and Hara, Takeshi, 3,926,948.
Hammann, Ingeborg: *See—*
Colln, Reimer; and Hammann, Ingeborg, 3,926,998.
Hammond, Michael J.; and Herner, Raymond F., to GTE Sylvania Incorporated. Haze resistant cathode luminescent sulfide phosphors and method of preparing same. 3,927,240, Cl. 428-403.000.
Hammond, Peter R., to Hammond, Peter R.; and United States of America, Navy. Lasing dye and method of preparation. 3,927,033, Cl. 260-343.20R.
Han, Shu Tang: *See—*
Chance, James L.; and Han, Shu Tang, 3,925,906.
Hancock Brick and Tile Company: *See—*
Shroy, Robert E.; and Schmunk, John, 3,926,222.
Hannah, John: *See—*
Rogers, Edward F.; Dybas, Richard A.; and Hannah, John, 3,926,935.
Hanney, Kenneth E. N.: *See—*
Loretto, John C.; and Hanney, Kerneth E. N., 3,926,752.
Hannibal, Billy B., to Tecumseh Products Company. Compressor oil pump with filter. 3,926,281, Cl. 184-6.160.
Hansen, Barton G.: *See—*
Sauer, Gale E.; and Hansen, Barton G., 3,925,948.
Hansen, Hans John; and Primus, Frederick James, to Hoffmann-La Roche Inc. Localization of tumors by radiolabelled antibodies. 3,927,193, Cl. 424-1.000.
Hanze, Arthur R., deceased: *See—*
Hester, Jackson B., Jr.; and Hanze, Arthur R., deceased, 3,927,016.
Hanze, Janice W., administratrix: *See—*
Hester, Jackson B., Jr.; and Hanze, Arthur R., deceased, 3,927,016.
Hara, Shinji: *See—*
Isojima, Imao; Doi, Yuzuru; and Hara, Shinji, 3,926,290.
Hara, Takeshi: *See—*
Kondo, Shinichi; Sezaki, Masaji; Koike, Makiko; Shimura, Masaru; Akita, Eiichi; Satoh, Kimio; Hamamoto, Kazuko; Niida, Taro; and Hara, Takeshi, 3,926,948.
Harada, Juntaro: *See—*
Katori, Tatsuhiko; Sato, Giichi; Kihara, Takashi; Yumoto, Norio; Makino, Shigeru; and Harada, Juntaro, 3,927,082.
Harada, Yoshiharu: *See—*
Adachi, Yoichi; and Harada, Yoshiharu, 3,926,750.
Hardway, Edward V., Jr.; and Holtman, William H., to Cavitron Corporation. Activity and respiration monitor. 3,926,177, Cl. 128-2.00S.
Hare, Woodrow W.: *See—*
Harrell, Edsel A.; Hare, Woodrow W.; and Young, John R., 3,926,371.
Hargis, Billy M., to Minnesota Mining and Manufacturing Company. Electrical interconnection for metallized ceramic arrays. 3,926,746, Cl. 204-15.000.
Harmes, Clyde S., III: *See—*
Nyiri, Laszlo P.; Humphrey, Arthur E.; and Harmes, Clyde S., III, 3,926,738.
Wilson, John D.; Nyiri, Laszlo K.; Humphrey, Arthur E.; and Harmes, Clyde S., III, 3,926,737.
Harmsen, Jan Willem; and Swinkels, Augustinus Petrus Jozephus, to U.S. Philips Corporation. Manufacturing a cold light mirror by evaporating ZnS and SiO alternately in an O_2 atmosphere. 3,926,508, Cl. 350-296.000.
Harmsma, Guenter; Rosenberg, Harry; Laabs, Johannes; and Becker, Kunibert, to Gewerkschaft Eisenhutte Westfalia. Roof support frames for mining. 3,925,995, Cl. 61-45.00D.
Harnisch, Horst, to Bayer Aktiengesellschaft. Naphtholactam dyestuffs. 3,927,005, Cl. 260-294.80B.
Harrap, John; and Stewart, Richard Gordon, to Parks-Cramer (Great Britain), Ltd. Method and apparatus for collecting fiber waste from open-end spinning machines. 3,926,665, Cl. 134-18.000.
Harrell, Edsel A.; Hare, Woodrow W.; and Young, John R., to United States of America, Agriculture. Apparatus and system for mixing pesticide with water concurrently with spraying. 3,926,371, Cl. 239-146.000.
Harris, Derrick: *See—*
Dryden, Gale E.; and Harris, Derrick, 3,926,379.
Harris, James A.; and Arthur, Jett C., Jr., to United States of America, Agriculture. Cotton-tung oil durable-press textiles with high flex abrasion resistance. 3,926,550, Cl. 8-116.00R.
Harris, Robert C., Jr.: *See—*
MacDonald, William E.; and Harris, Robert C., Jr., 3,927,230.
Harsanyi, Kalman: *See—*
Korbonits, Dezso; Harsanyi, Kalman; Molnar nee Bako, Erzsebet; Takacs, Kalman; Heja, Gergely; Bodnar, Janos; Bodrogi, Istvan; and Erodi, Judit, 3,927,025.
Harvey, Kenneth; and Lee, Sydney, to Colgate-Palmolive Company. Dentifrices. 3,927,202, Cl. 424-57.000.
HASCO-Normalien Hasenclever & Co.: *See—*
Heuel, Otto; and Emmerichs, Heinz, 3,927,301.
Hasegawa, Susumu: *See—*
Shimada, Toshikazu; Komatsubara, Kiichi; Hasegawa, Susumu; and Kato, Yoshiki, 3,926,682.
Hasson, Harrith M. Surgical closure having ease of assembly. 3,926,193, Cl. 128-335.000.
Haszeldine, Robert Neville; and Rowland, Ronald, to Pennwalt Corporation. Process for insertion of hexafluoropropene at the aliphatic carbon-hydrogen bond of a functionally substituted hydrocarbon. 3,927,129, Cl. 260-653.10R.
Hattori, Kiyoji: *See—*
Takayama, Kenichiro; Adachi, Tetsuo; Kohata, Mamoru; Hattori, Kiyoji; and Tomiyama, Tomoko, 3,926,724.
Hatz, Ernst; and Schmuck, Johann, to Motorenfabrik Hatz KG. Internal combustion engine with silencing means. 3,926,155, Cl. 123-41.680.
Hauenstine, Edgar F., to P. R. Mallory & Co. Inc. Snap switch. 3,927,289, Cl. 200-284.000.
Hauenstine, Edgar F.: *See—*
Utken, Jay; and Hauenstine, Edgar F., 3,927,288.
Haughwitz, Rudiger D.: *See—*
Rovnyak, George; Narayanan, Venkatachala L.; Haughwitz, Rudiger D.; and Cimarusti, Christopher M., 3,926,982.
Haugwitz, Rudiger D.; and Narayanan, Venkatachala L., to E. R. Squibb & Sons, Inc. 2-(Heterocyclicmethylideneamino)benzimidazoles and derivatives thereof. 3,926,967, Cl. 260-240.00A.
Haugwitz, Rudiger D.: *See—*
Rovnyak, George; Narayanan, Venkatachala L.; Haugwitz, Rudiger D.; and Cimarusti, Christopher M., 3,927,014.
Hauser, Raimund: *See—*
Freudenschuss, Otto, 3,926,512.
Hayashi, Kenji; Yumde, Yasufumi; and Kawamura, Kotaro, to Hitachi, Ltd. Frequency dependent compensating circuit for magnetic recording signals. 3,927,420, Cl. 360-65.000.
Hayashi, Makoto; Hinata, Masanori; Yokota, Minoru; and Kondo, Takasi, to Sumitomo Electric Industries, Ltd. Hydrostatic extrusion process for producing fine gauge wires. 3,926,023, Cl. 72-60.000.
Hayashi, Noriyuki; Sasaki, Kenji; Inaba, Hideaki; and Nonaka, Koushi, to Bridgestone Tire Company Limited. Elastomer composition. 3,927,144, Cl. 260-888.000.
Hayes, Christopher W. J.: *See—*
Reid, John S.; and Hayes, Christopher W. J., 3,927,353.
Hayes, Phil H.: *See—*
Thomas, David G.; Mixon, William R.; and Hayes, Phil H., 3,926,799.
Hayes, Robert I., Jr.: *See—*
Furr, Robert L.; and Hayes, Robert I., Jr., 3,926,432.
Hazen Research, Inc.: *See—*
Goren, Mayer B.; and Coltrinari, Enzo L., 3,927,169.

Heathcote, Bernard Vincent: *See—*
Adams, Stuart Sanders; Armitage, Bernard John; Bristow, Norman William; and Heathcote, Bernard Vincent, 3,927,029.

Hebert, Jacques J.: *See—*
Ward, Truman L.; Benerito, Ruth R.; and Hebert, Jacques J., 3,926,709.

Hedgpeth, Joel, to Water Science Inc. Method for removing both organic matter and bacteria from a body of water. 3,926,802, Cl. 210-62.000.

Heemann, Volker: *See—*
Francke, Wittko; and Heemann, Volker, 3,927,207.

Heenan, Sidney A., to Amerace Corporation. Pin having nonaligned cube axis and pin axis and bundle of such pins. 3,926,402, Cl. 249-117.000.

Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., to Janssen Pharmaceutica N.V. 1-(β-Aryl-β-R-ethyl)imidazoles. 3,927,017, Cl. 260-309.000.

Heiba, El-Ahmadi I.: *See—*
Dickert, Joseph J., Jr.; and Heiba, El-Ahmadi I., 3,926,820.

Heinemann, Otto, to Polysius AG. Process and apparatus for cooling of fired or sintered material. 3,925,907, Cl. 34-20.000.

Heisig, Wilhelm. Method of producing and packaging gloves formed of thermoplastic foil. 3,925,958, Cl. 53-21.0FW.

Heja, Gergely: *See—*
Korbonits, Dezso; Harsanyi, Kalman; Molnar nee Bako, Erzsebet; Takacs, Kalman; Heja, Gergely; Bodnar, Janos; Bodrogi, Istvan; and Erodi, Judit, 3,927,025.

Heldenbrand, Stanley W.; Johnson, David L.; and Mote, Neil H., to Seaco Computer-Display Incorporated. Sheet feeding apparatus. 3,926,428, Cl. 271-109.000.

Hella, Richard A.: *See—*
Locke, Edward V.; and Hella, Richard A., 3,926,510.

Hellerbach, Joseph; and Szente, Andre, to Hoffman-La Roche Inc. Diarylmethane derivatives and processes for their preparation. 3,927,010, Cl. 260-296.00R.

Hellmuth, Walter W.: *See—*
Miller, Edward F.; and Hellmuth, Walter W., 3,927,104.

Helser, Jerry L.: *See—*
Shannon, Richard F.; and Helser, Jerry L., 3,926,653.

Hemingway, Maurice; and Ward, Trevor, to Hotwork Limited. Method of heating the interior and structure of large vessels or enclosures. 3,926,543, Cl. 431-9.000.

Hemmelsbach, Richard J., to Space Age Industries, Inc. Modular structure formed of interconnected tubular members. 3,925,942, Cl. 52-86.000.

Hendricks, Thomas L.: *See—*
Brooks, Wayne D.; and Hendricks, Thomas L., 3,926,032.

Hendrickson, Thomas A.: *See—*
Davis, Stephen A.; Dougherty, Keith H.; Levit, Alan D.; Hendrickson, Thomas A.; and Sanderson, Kenneth R., 3,926,088.

Henk, Michael G.; and Sartler, Gary P., to Standard Oil Company. Alpha-methyl styrene/tertiary butyl styrene/olefin terepolymer resins and hot melt adhesives containing the same. 3,926,882, Cl. 260-28.5AV.

Henkel & Cie GmbH: *See—*
Rall, Ulrich; Mahall, Karl; and Kuper, Wilfried, 3,927,229.
Wendler, Ingrid; and Malaszkiewicz, Jurgen, 3,926,840.

Henrich KG, Firma: *See—*
Zettl, Heinrich; and Decker, Klaus, 3,927,296.

Hensley, Linda W.; and Li, George S., to Standard Oil Company, The. Polymerizates of olefinic nitriles. 3,926,871, Cl. 260-80.720.

Hentrich, Donald M. Modular furniture structure assembly. 3,926,483, Cl. 312-107.000.

Henzi, Beat, to Sandoz, Ltd. Azo dyes having a triazolium diazo component radical with a fused cycloalkyl ring. 3,926,941, Cl. 260-146.00R.

Hercules Incorporated: *See—*
Breslow, David S.; and Simpson, David A., 3,926,642.
Cessna, Lawrence C., Jr., 3,926,897.
Engle, Edward Jacob, III, 3,926,907.
Miles, Jeffrey M., 3,926,655.
Restaino, Alfred J., 3,926,756.

Herem, Henn-Jaak Eerovich: *See—*
Klementi, Toe Jokhannesovich; Herem, Henn-Jaak Eerovich; and Skornyakov, Eduard Petrovich, 3,926,589.

Herms, Heinrich, to O & K Orenstein & Koppel Aktiengesellschaft. Conveyor assembly. 3,926,301, Cl. 198-90.000.

Herner, Raymond F.: *See—*
Hammond, Michael J.; and Herner, Raymond F., 3,927,240.

Herold, Franz Dieter, to Original Hanau Quarzlampen GmbH. Surgical operating lamp with individual spot-lights. 3,927,313, Cl. 240-1.400.

Herrling, Siegfried: *See—*
Kiesewetter, Erwin; and Herrling, Siegfried, 3,926,954.

Herron, William; Adams, Kenneth D.; and Petronchak, John, to Singer Company, The. Sewing machine safety device. 3,926,133, Cl. 112-158.00R.

Hersh, Marvin, to American Home Products Corporation. Soluble capsules. 3,927,196, Cl. 424-37.000.

Hesse, Reiner: *See—*
Bernhard, Horst; Esselborn, Reiner; Hesse, Reiner; and Russmann, Horst, 3,926,659.

Hesse, Sarah; and Shapiro, Justin J. Graphics Instrument. 3,925,899, Cl. 33-75.000.

Hesselman, Karlheinz: *See—*
Wetzler, Josef; Neumann, Wilhelm; and Hesselman, Karlheinz, 3,926,712.

Hessert, James E.; and Johnston, Chester C., Jr., to Phillips Petroleum Company. Method for reducing formation permeability with gelled polymer solution having delayed gel time. 3,926,258, Cl. 166-294.000.

Hesston Corporation: *See—*
Goering, Lowell J.; and Fell, Ferol S., 3,925,971.

Hester, Jackson B., Jr.; and Hanze, Arthur R., deceased (by Hanze, Janice W., administratrix), to Upjohn Company, The. 6-Substituted 4H-imidazo (1,2-a) (1,4)-benzodiazepine-1-carboxaldehydes and processes for their production. 3,927,016, Cl. 260-309.000.

Hester, William F., to General Electric Company. Apparatus and method for deforming tubing for ultrasonic welding of the tubing to a planar structure. 3,926,358, Cl. 228-111.000.

Hetmanski, Casimir: *See—*
Bjelland, Ronald W.; Narwicz, Charles A.; and Hetmanski, Casimir, 3,926,331.

Heuel, Otto; and Emmerichs, Heinz, to HASCO-Normalien Hasenclever & Co. Electrical heating cartridge. 3,927,301, Cl. 219-523.000.

Hewitt, Frederick M. Extruder with interacting auger and care means. 3,926,541, Cl. 425-64.000.

Hewitt, Graham: *See—*
Barton, Derek Harold Richard; Underwood, William George Elphinstone; Looker, Brian Edgar; and Hewitt, Graham, 3,927,013.

Hewitt, John H.: *See—*
Woodling, Gerald L.; Hewitt, John H.; and Johnson, Ernest D., 3,926,296.

Hewlett-Packard Company: *See—*
Paulson, Gary L., 3,926,061.

Hi-Shear Corporation: *See—*
Bunker, James W., 3,926,090.

Hibi, Tadatoshi; and Okura, Keniti, to Pioneer Electronic Corporation. Stylus shoe suspension arrangement for a phonograph pickup cartridge. 3,926,441, Cl. 274-37.000.

Hicks, John Wilbur, Jr. Method for making glass blades. 3,926,601, Cl. 65-31.000.

Higgs, Richard F.: *See—*
Brendlinger, Edward C.; Higgs, Richard F.; and Kharouf, Issa J., 3,926,767.

Hilderbrand, Henry R., to Raymond Lee Organization, Inc., The, a part interest. Disposable container with napkin holder. 3,926,361, Cl. 229-1.50B.

Hill, Ruth Linda: *See—*
Borror, Alan L.; Hill, Ruth Linda; and Garcia, Paulina P., 3,926,971.

Hill, William Frank, to Lucas Electrical Company Limited, The. Vehicle warning systems. 3,927,390, Cl. 340-60.000.

Hills, William H.: *See—*
Trifunovic, Alexander L.; Hills, William H.; Borgman, Milton H.; and Mersereau, Emory P., 3,925,976.

Himmelmann, Wolfgang: *See—*
Saleck, Wilhelm; Engelhard, Helmut; Himmelmann, Wolfgang; Bentz, Francis; and Mader, Helmut, 3,926,635.

Hinata, Masanori: *See—*
Hayashi, Makoto; Hinata, Masanori; Yokota, Minoru; and Kondo, Takasi, 3,926,023.

Hind, Robert Duncan, to United States Steel Corporation. Casting of metals. 3,926,406, Cl. 251-144.000.

Hirabara, Chikao: *See—*
Sato, Yashuhiro; and Hirabara, Chikao, 3,927,381.

Hirabayashi, Nobuhiro, to Shin-Shirasuma Electric Corporation. Magnetic reproducing device. 3,926,387, Cl. 242-198.000.

Hirata, Yoshimi: *See—*
Ando, Tetsuo; and Hirata, Yoshimi, 3,927,418.

Hirono, Yoshihiko: *See—*
Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; Ishikawa, Hisao; Yamada, Shozo; Yasuda, Yasushi; and Asada, Mitsuo, 3,927,034.

Hirose, Takeshi: *See—*
Sugizaki, Atsushi; Hirose, Takeshi; Yokota, Yukio; Okumura, Akio; Oishi, Yasushi; and Arai, Atsuaki, 3,926,634.

Hitachi Electronics Ltd.: *See—*
Yoshino, Takehiko; Yanagimachi, Akio; Uehara, Takashi; Takezawa, Teruhiro; Fukuda, Masaaki; and Kayano, Tatsuo, 3,927,269.

Hitachi, Ltd.: *See—*
Hayashi, Kenji; Yumde, Yasufumi; and Kawamura, Kotaro, 3,927,420.
Izumi, Kenkichi, 3,926,739.
Miyadera, Yasuo; and Yokokura, Hisao, 3,926,914.
Nakashima, Akio; and Arakawa, Yoshihiro, 3,927,331.
Shimada, Toshikazu; Komatsubara, Kiichi; Hasegawa, Susumu; and Kato, Yoshiki, 3,926,682.
Suzuki, Hirofumi, 3,927,340.

Hitachi Metals, Ltd.: *See—*
Kiyonaga, Kingo; and Murakawa, Yoshiyuki, 3,926,622.

HITCO: *See—*
Vasterling, Paul F., 3,927,157.

Hitzel, Volker: *See—*
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Hitzel, Volker, 3,927,088.

Ho, Irving T.: *See—*
Chen, Tien C.; and Ho, Irving T., 3,927,311.

Hoagland, Amos N.; and Jensen, Jens S. Ball retrieving and storage devices. 3,926,465, Cl. 294-19.00A.

Hodgdon, Russell B., Jr., to Ionics, Incorporated. Ion exchange membranes having a macroporous surface area. 3,926,864, Cl. 260-2.10E.
Hodgson, Clive, to Chevron Research Company. Process for producing hydroxy-aluminum nitrate polymer. 3,927,184, Cl. 423-394.000.
Hodson, David George; and Peat, Derek, to National Research Development Corporation. Yarn detection devices. 3,927,356, Cl. 317-123.000.
Hoechst Aktiengesellschaft: *See—*
Clauss, Karl; Jensen, Harald; and Luck, Erich, 3,926,976.
Clauss, Karl; Schnabel, Horst; and Jensen, Harald, 3,926,981.
Gudernatsch, Hugo; Jaekel, Gerhart; Kroll, Wolfgang; Oden, Volker; and Reinhardt, Konrad, 3,926,810.
Lange, Jost; Schneider, Gerhart; and Zeh, Albert, 3,926,650.
Rebsdat, Siegfried; and Hahn, Helmut, 3,926,989.
Reuter, Martin; and Beermann, Claus, 3,927,112.
Reuter, Martin; and Rupp, Walter, 3,927,113.
Rosinger, Sigurd, 3,926,757.
Spiess, Bernhard, 3,927,098.
Strobel, Wolfgang; Jaenicke, Ottokar; Schuddemage, Horst-Dieter; and Jastrow, Horst, 3,927,142.
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Hitzel, Volker, 3,927,088.
Hoekje, Howard H., to PPG Industries, Inc. Electrolytic cell having silicon bipolar electrodes. 3,926,770, Cl. 204-256.000.
Hoerbiger Ventilwerke Aktiengesellschaft: *See—*
Hrabal, Hans, 3,926,214.
Hoffman, Doyt K.; and Bach, Ricardo O., to Lithium Corporation of America. Preparation of mixed chlorohydrides of aluminum. 3,926,833, Cl. 252-188.000.
Hoffman-La Roche Inc.: *See—*
Edenhofer, Albrecht, 3,926,986.
Hellerbach, Joseph; and Szente, Andre, 3,927,010.
Hoffman, Robert K., to Parker-Hannifin Corporation. Airline lubricator. 3,926,280, Cl. 184-55.00A.
Hoffman, Robert Kendall, to Parker-Hannifin Corporation. Pressure regulator. 3,926,208, Cl. 137-484.800.
Hoffmann-La Roche Inc.: *See—*
Boller, Arthur; and Scherrer, Hanspeter, 3,927,064.
Edenhofer, Albrecht, 3,927,006.
Furst, Andor; Buchschacher, Paul; Kagi, Dieter; Meier, Werner; Muller, Marcel; and Widmer, Erich, 3,927,032.
Hajos, Zoltan George, 3,927,031.
Hansen, Hans John; and Primus, Frederick James, 3,927,193.
Kyburz, Emilio; and Spiegelberg, Hans, 3,927,128.
Scherrer, Hanspeter; and Boller, Arthur, 3,927,066.
Hofman, Emiel Alexander; Berendsen, Jules Robert; and Pollet, Robert Joseph, to Agfa-Gevaert, N.V. Photographic silver halide lith material. 3,926,632, Cl. 96-66.500.
Hofman, Josef: *See—*
Uthemann, Wolfgang; and Hofman, Josef, 3,926,202.
Hogan, Gerard T., to Universal Oil Products Company. Adjustable type of armrest unit. 3,926,473, Cl. 297-115.000.
Hogarth, Robert E., to A. O. Smith Harvestore Products, Inc. High moisture material drainage structure and method. 3,926,814, Cl. 210-323.000.
Hoivik, Lars: *See—*
Sodal, Ingvar E.; Hoivik, Lars; Micco, Alexander J.; Weil, John V.; and Baer, Norman W., 3,926,209.
Hoja, Jerzy: *See—*
Zielonko, Romuald; Hoja, Jerzy; and Wojciechowski, Henryk, 3,927,368.
Holcombe, Frank O., Jr., to Burton, Parsons & Company, Inc. Hydrophilic contact lenses and lens polymer. 3,926,892, Cl. 260-29.6TA.
Holle, Bernd; and Winter, Gerhard, to Bayer Aktiengesellschaft. Titanium dioxide pigment coated with layers of aluminum oxide and metal phosphate. 3,926,660, Cl. 106-300.000.
Holleyman, John E. Compressed air power plant. 3,925,984, Cl. 60-370.000.
Hollingshead, William S., to Goodyear Tire & Rubber Company, The. Process of preparing catalyst free aromatic diamines. 3,927,099, Cl. 260-576.000.
Hollymatic Corporation: *See—*
Breyer, Frederick; Davis, George T.; and Krusche, Edwin C., 3,926,146.
Holmes, Jerry D., to Eastman Kodak Company. Production of 2,2-disubstituted propiolactones. 3,927,035, Cl. 260-343.900.
Holmes, William A.: *See—*
Dantowitz, Philip; and Holmes, William A., 3,926,020.
Holtman, William H.: *See—*
Hardway, Edward V., Jr.; and Holtman, William H., 3,926,177.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Morioka, Minoru; and Mikami, Tetuo, 3,926,274.
Shino, Makoto; and Saito, Mitsuo, 3,926,277.
Honeywell Information Systems Inc.: *See—*
Chow, Ling George; and Bartran, David S., 3,927,397.
Muth, Robert M., 3,926,145.
Honjo, Satoru, to Fuji Photo Film Co., Ltd. Using photoconductive and non-photoconductive powders. 3,926,628, Cl. 96-1.00R.
Honjo, Satoru; Tamai, Yasuo; and Tsuji, obuo, to Xerox Corporation. Liquid developer composition and process for preparing same. 3,926,825, Cl. 252-62.100.
Honsel, Karl-Heinz. Application of adhesive to a moving web. 3,926,148, Cl. 118-247.000.
Hooker Chemicals & Plastics Corporation: *See—*
Evans, Leo G.; and Ruthel, Walter W., 3,925,886.
Hooker, Phillip R.: *See—*
Marsden, Sullivan S., Jr.; and Hooker, Phillip R., 3,926,203.
Hooton, Daniel Edwards: *See—*
Circle, Sidney Joseph; Fergle, Richard Raymond; Watkins, Leslie Ray; and Hooton, Daniel Edwards, 3,926,940.
Hopkins, Henry S., Jr.; and Gordon, Philip L., to General Latex and Chemical Corporation. Cellular-urethane backed carpet. 3,926,700, Cl. 428-95.000.
Hopland, Johan N.: *See—*
Bisseli, Sherman M.; De Vlieg, Garrett H.; and Hopland, Johan N., 3,926,479.
Hoppe, Paul Peter, Jr., to Bunker Ramo Corporation. Electrical connector and insulation-piercing contact member. 3,926,498, Cl. 339-97.00R.
Hopster, Eugene E.: *See—*
O'Connell, Harry P., Jr.; and Hopster, Eugene E., 3,925,940.
Hopwood, Charles E. Sensor unit. 3,927,287, Cl. 200-61.470.
Hori, Ryuzo: *See—*
Oki, Masami; Hori, Ryuzo; and Miwa, Naoto, 3,926,702.
Horie, Ikutaro; Miyazako, Taksuhi; and Shimada, Takeo, to Fuji Photo Film Co., Ltd. Process for hardening gelatin in photographic layers which contain a thickener and hardener by utilizing acrylic acid-acrylamide copolymers. 3,926,869, Cl. 260-8.000.
Horiguchi, Shojiro; Nakamura, Michiei; Nakajima, Keiji; and Seino, Yoshio, to Dainichiswika Color & Chemicals Mfg. Co., Ltd. Detergent composition having polymer bonded indicator. 3,926,830, Cl. 252-135.000.
Horio, Takehiro; Tsuda, Katsuhisa; Imai, Tadashi; Mitsutsuka, Masashi; and Morise, Heiji, to Nippon Steel Corporation. Tuyere for blowing gas into a melting furnace. 3,926,417, Cl. 266-41.000.
Horn, Richard E.; and Grenda, David W., to Pitt Metals and Chemicals, Inc. Process for recovering tin salts from the waste rinse water of a halogen tin plating process. 3,926,759, Cl. 204-180.00P.
Horvath, Steven Joseph: *See—*
Geiger, Kenneth Daniel; Horvath, Steven Joseph; Kallay, Victor Paul; Seymour, Theodore Joseph; Watson, Thorpe Wesley; and Zervoudis, John, 3,926,247.
Hosaka, Hirokazu: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,927,114.
Hosegood, Samuel Brittan, to United Kingdom Atomic Energy Authority. Gas cooled nuclear reactor fuel elements. 3,926,720, Cl. 176-18.000.
Hostettler, Paul: *See—*
Jaccard, Roland; Hostettler, Paul; and Siegrist, Rudolf, 3,926,917.
Hothan, Harold A. Liquid detecting gauge. 3,926,143, Cl. 116-118.00R.
Hotwork Limited: *See—*
Hemingway, Maurice; and Ward, Trevor, 3,926,543.
Houdaille Industries, Inc.: *See—*
von Langendorff, Vitmar G., 3,926,082.
Houlihan, William J., to Sandoz, Inc. 3-(2-Methyl-1-imidazolyl)-3-phenyl-1-(3H)isobenzofuranones. 3,927,018, Cl. 260-309.000.
Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz, Inc. Bis-substituted or unsubstituted-p-benzoylbenzyl acetic acids. 3,927,079, Cl. 260-501.100.
Houlihan, William J.; and Manning, Robert E., to Sandoz Inc. Substituted benzylideneamino guanidines. 3,927,096, Cl. 260-564.00F.
House, Ralph: *See—*
Danzik, Mitchell; and House, Ralph, 3,927,061.
Howe, David G., to United States of America, Navy. High critical current superconductors and preparation thereof. 3,926,684, Cl. 148-11.50R.
Hoy, Robert P.: *See—*
Shively, Lawrence A.; and Hoy, Robert P., 3,926,320.
Hrabal, Hans, to Hoerbiger Ventilwerke Aktiengesellschaft. Lamella valve for piston compressors. 3,926,214, Cl. 137-525.300.
Hristea, Ieronim: *See—*
Constantinescu, Petre; Hristea, Nicolae; Blebea, Speranta; Hristea, Ieronim; Huniadi, Mihai; and Gabureanu, Mircea, 3,925,928.
Hristea, Nicolae: *See—*
Constantinescu, Petre; Hristea, Nicolae; Blebea, Speranta; Hristea, Ieronim; Huniadi, Mihai; and Gabureanu, Mircea, 3,925,928.
Huang, Ching Yun; Shimizu, Senzo; and Adachi, Hiroyuki, to Mitsubishi Gas Chemical company, Inc. Process for producing cationic synthetic latex involving emulsion polymerization of haloalkyl esters of acrylic and methacrylic acid followed by quarternization with tertiary amine. 3,926,890, Cl. 260-29.60H.
Hubbard, Ann Frances: *See—*
Burton, George; Davies, John Sydney; and Hubbard, Ann Frances, 3,926,955.
Hubbard, David W.; and Kittredge, Lloyd G., to Pitney-Bowes, Inc. Hand held ticket printer applicator. 3,926,110, Cl. 101-92.000.
Huber-Emden, Helmut; Eschle, Karl; and Maeder, Arthur, to Ciba-Geigy Corporation. Carboxylic acid amides. 3,927,091, Cl. 260-559.00T.
Huber-Emden, Helmut, to Ciba-Geigy AG. Process for the manufacture of polyfluoroalcohols and their use. 3,927,126, Cl. 260-633.000.
Hughes, John Lawrence; Seyler, Jay Kenneth; and Liu, Robert Chung-Huang, to Armour Pharmaceutical Company. Synthesis of salmon calcitonin. 3,926,938, Cl. 260-112.500.
Hughes, Richard Henry, to RCA Corporation. Cathode ray tube gun having nested electrode assembly. 3,927,341, Cl. 313-412.000.

Hughes, Robert L.: *See—*
Roth, Clarence Edward, Jr.; Hughes, Robert L.; and Thompson, Kenneth F., 3,927,245.

Humbert, Jean Jacques; Thomas, Jean Pierre Francis; Brut, Gerard Yvan; and Gounou, Jean Marie Joseph Elie, to Societe Nationale des Poudres et Explosifs. Solid block of propellant with a plurality of propulsion stages and methods of manufacture. 3,926,697, Cl. 149-14.000.

Humphrey, Arthur E.: *See—*
Nyiri, Laszlo P.; Humphrey, Arthur E.; and Harmes, Clyde S., III, 3,926,738.
Wilson, John D.; Nyiri, Laszlo K.; Humphrey, Arthur E.; and Harmes, Clyde S., III, 3,926,737.

Hungate, Frank Porter; Riemath, William Frederic; and Bunnell, Lee Roy, to United States of America, Energy Research and Development Administration. Tissue irradiator. 3,927,325, Cl. 250-435.000.

Huniadi, Mihai: *See—*
Constantinescu, Petre; Hristea, Nicolae; Blebea, Speranta; Hristea, Ieronim; Huniadi, Mihai; and Gabureanu, Mircea, 3,925,928.

Hunt, Patrick J.: *See—*
Creswick, William E.; and Hunt, Patrick J., 3,926,686.

Hunter, Australia. Portable electric hydraulic johnny aid. 3,925,833, Cl. 4-251.000.

Huntington, Howard E.: *See—*
Frodsham, Vaughn D., 3,925,890.

Hunwicks, Alec Alfred, to Brown Brothers Engineering Limited. Vehicle seat slides. 3,926,397, Cl. 248-430.000.

Huper, Fritz; and Rauenbusch, Erich, to Bayer Aktiengesellschaft. Separation and purification of alpha-amylase. 3,926,730, Cl. 195-66.00R.

Hurst, Gerald L.; and Machacek, Oldrich, to Tyler Holding Company. Explosive device. 3,926,119, Cl. 102-24.00R.

Husband, Reed J. Accelerator damper. 3,926,160, Cl. 123-103.00E.

Husqvarna AB: *See—*
Andersson, Kjell Arne, 3,925,972.

Husted, Donald R.: *See—*
Koshar, Robert J.; Husted, Donald R.; Wright, Charles D.; and Zollinger, Joseph La Mar, 3,927,103.

Huth, Clinton C. Baiting device. 3,925,919, Cl. 43-4.000.

Huygelen, Constant: *See—*
Zygraich, Nathan; and Huygelen, Constant, 3,927,208.

Huyot, Antje S.: *See—*
Huyot, Robert; and Huyot, Antje S., 3,925,826.

Huyot, Robert; and Huyot, Antje S. Sanitary apparatus. 3,925,826, Cl. 4-7.000.

Hyatt, Gilbert P.: *See—*
Lee, Barry T.; Wimmer, Gunther W.; and Hyatt, Gilbert P., 3,927,411.

Hydroacoustics, Inc.: *See—*
Bouyoucos, John V., 3,926,265.

Hydrocarbon Research, Inc.: *See—*
Wolk, Ronald H., 3,926,783.

Hydron Limited: *See—*
Seymour, Donald Edwin; da Costa, Nicholas Mario; and Charville, William Thomas, 3,927,203.

Hydrophilics International, Inc.: *See—*
Blank, Izhak; and Fertig, Joseph, 3,927,206.

Hydrospace Industries, Inc.: *See—*
Burgess, Kenneth G., 3,926,768.

I.S.F. Societa per Azioni: *See—*
Antonini, Eraldo; and I.S.F. Societa per Azioni, 3,926,726.

I-T-E Imperial Corporation: *See—*
Tahiliani, Vasu H.; and Graybill, Howard W., 3,927,246.

Ichikawa, Tomomichi; and Fukami, Sigetosi, to Ajinomoto Co., Inc.; and Nihon Emulsion Co., Inc. Novel N-long chain acyl-acidic amino acid diester. 3,927,047, Cl. 260-404.000.

Ichikawa, Yasushi: *See—*
Ohfuka, Toshio; Schichijo, Yoshihisa; Ichikawa, Yasushi; and Yamamoto, Katsuo, 3,926,930.

Ichikawa, Yoshihiro; Fujisawa, Tetsuo; and Seo, Yoshiro, to Kobe Steel, Ltd. Method and apparatus for use in firing raw material for cement. 3,926,651, Cl. 106-100.000.

Ichinose, Noboru; Yokomizo, Yuhji; and Katsura, Masaki, to Tokyo Shibaura Electric Co., Ltd. Moisture sensitive element. 3,926,858, Cl. 252-517.000.

ICI Australia Limited: *See—*
Baklien, Asbjorn; and Kolm, Jan, 3,927,097.
Forsyth, Bruce Adam; and Pryor, David Ernest, 3,927,071.

ICN Pharmaceuticals, Inc.: *See—*
Witkowski, Joseph T.; and Robins, Roland K., 3,927,216.

Idemitsu Kosan Company Limited: *See—*
Tomikawa, Masami; Ohkawa, Hideo; and Tsunoda, Akiji, 3,927,159.

Iglesias, Jose J. Urological bladder evacuator. 3,926,187, Cl. 128-232.000.

IISI Products AG: *See—*
Ackeret, Peter, 3,926,310.

Ilford Limited: *See—*
Sheldrick, George Edward, 3,926,525.

Illinois Tool Works Inc.: *See—*
Hagel, John Louis; Pape, Robert Carl; and Reinwall, Ernest William, Jr., 3,925,952.
Klygis, Mindaugas Julius, 3,926,307.

Imada, Seiya: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,927,114.

Imai, Tadashi: *See—*
Horio, Takehiro; Tsuda, Katsuhisa; Imai, Tadashi; Mitsutsuka, Masashi; and Morise, Heiji, 3,926,417.

Imanari, Makoto: *See—*
Watanabe, Yoshihisa; Imanari, Makoto; Nojiri, Naohiro; and Fuga, Nobuhiko, 3,926,915.

Imperato, Louis George, Jr., to Blocked Iron Corporation. Lump ore products and methods of making the same. 3,926,616, Cl. 75-3.000.

Imperial Chemical Industries Limited: *See—*
Adsetts, John Robert, 3,926,584.
Anderson, Norman Stewart, 3,926,865.
Berrie, Alistair Howard; and Budziarek, Richard, 3,926,944.
Cole, Susan Margaret; Mason, David Robert; and Rothon, Roger Norman, 3,926,658.
Edgar, Owen Burchell; and Yates, Michael Richard, 3,926,924.
Potter, Sheila Antoinette, 3,927,009.
Ray, Neil Hunter; Laycock, John Nicholas Clayton; and Robinson, William Derek, 3,926,649.
Ridyard, Denis Robert Annesley, 3,926,946.
Tomlin, Clive Dudley Spencer; Barlow, Charles Brian; and White, Brian Graham, 3,926,611.
Yelland, Michael, 3,926,942.

Imperial-Eastman Corporation: *See—*
Kowal, Leonard J., 3,926,028.

Imperial Metal Industries (Kynoch) Limited: *See—*
Sambrook, David John, 3,925,882.

Inaba, Hideaki: *See—*
Hayashi, Noriyuki; Sasaki, Kenji; Inaba, Hideaki; and Nonaka, Koushi, 3,927,144.

Inaba, Shigeho: *See—*
Ishizumi, Kikuo; Mori, Kazuo; Yamamoto, Michihiro; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 3,926,993.

Index Packages, Inc.: *See—*
Lander, William M., 3,926,144.

Indian Head, Inc.: *See—*
Dixon, Jack R., 3,926,170.
Trifunovic, Alexander L.; Hills, William H.; Borgman, Milton H.; and Mersereau, Emory P., 3,925,976.

Industrial Nucleonics Corporation: *See—*
Spitz, David A., 3,926,719.

Ing. C. Olivetti & Co., S.p.A.: *See—*
Zambolin, Adriano; and De Falco, Gianfranco, 3,927,274.

Ingenior F. Selmer A/S: *See—*
Hafskjold, Petter Sigvardt, 3,925,997.

Ingersoll, H. Gilbert: *See—*
Graham, Boynton; and Ingersoll, H. Gilbert, 3,926,826.

Ingersoll-Rand Company: *See—*
Bizilia, Paul K., 3,926,212.
Coski, William D., 3,926,268.

Inoue, Kiyoshi. Preparation of dental cements. 3,926,646, Cl. 106-35.000.

Inoue, Nobuyoshi, to Copal Company Limited. Shutter for cameras. 3,927,416, Cl. 354-235.000.

Inouye, Shigeharu: *See—*
Tsuruoka, Takashi; Niwa, Tomizo; Shibata, Uichi; Inouye, Shigeharu; and Niida, Taro, 3,927,001.

Institut Francais du Petrole: *See—*
Marrast, Jacques; Minssieux, Louis; and Blondin, Eric, 3,926,257.

Instituto Sieroterapico e Vaccinogeno Toscano "Sclavo" S.p.A.: *See—*
Neri, Paolo; Antoni, Guido; and Benvenuti, Franco, 3,927,204.

Instrumentation Laboratory, Inc.: *See—*
Haddad, Ihsan A., 3,926,765.

Interdye Technology Corporation: *See—*
O'Mahony, Gerard M.; and Paterson, James G. T., 3,926,547.

Interlake, Inc.: *See—*
Keyser, Naaman H.; and Mertdogan, Akgun, 3,926,623.
Krikau, Frederick G., 3,926,740.

International Business Machines, Corporation: *See—*
Chen, Tien C.; and Ho, Irving T., 3,927,311.
Davis, Stephen A.; Dougherty, Keith H.; Levit, Alan D.; Hendrickson, Thomas A.; and Sanderson, Kenneth R., 3,926,088.
Elliott, James Francis; and Johnson, Joel Swenum, 3,926,312.
Frosch, Albert; and Korth, Hans Erdmann, 3,926,500.
Pimbley, Walter T., 3,927,410.
Pomeranz, Jehoshua Naphtali; and Schnurmann, Henri Daniel, 3,927,371.
Reisman, Arnold, 3,926,763.

International Flavors & Fragrances Inc.: *See—*
Chappell, Robert L., 3,926,860.
Hall, John B.; Lala, Lekhu Kewalram; Beets, Muus G. J.; and Taylor, William I., 3,927,083.
Wiegers, Wilhelmus J.; and Hall, John B., 3,927,109.

International Harvester Company: *See—*
Packard, Norman M., 3,926,166.

International Nickel Company, Inc., The: *See—*
Benjamin, John Stanwood; and Schultz, Jay Ward, 3,926,568.

International Standard Electric Corporation: *See—*
Bauer, Werner, 3,927,364.
Wuyts, Oscar; Carpentier, Felix Joanna Petrus; and Wouters, Ludovicus Josephus Albertus, 3,927,277.
Zschunke, Willmut, 3,927,372.

International Telephone and Telegraph Corporation: *See*—
Acevedo, Generoso, 3,927,271.
Garnett, Lawrence Taylor, 3,926,055.
Jezo, Maurice Leon Jean, 3,927,384.
Schlatter, Gerald Lance, 3,926,035.
U, Aung San, 3,926,695.
International Time Recording Company Ltd.: *See*—
Lamb, Kenneth; and Froud, Roderick Wilson, 3,927,302.
Interpace Corporation: *See*—
MacDonald, William E.; and Harris, Robert C., Jr., 3,927,230.
Interpile USA, Inc.: *See*—
LeCorgne, William R., 3,925,998.
Intreprinderea 30 Decembrie: *See*—
Constantinescu, Petre; Hristea, Nicolae; Blebea, Speranta; Hristea, Ieronim; Huniadi, Mihai; and Gabureanu, Mircea, 3,925,928.
Ionics, Incorporated: *See*—
Hodgdon, Russell B., Jr., 3,926,864.
Ireco Chemicals: *See*—
Cook, Melvin A.; and Hagmann, Mark J., 3,926,698.
Irwin, Roy E.; and Aufhauser, Alfred. Method and apparatus for wax deoiling. 3,926,776, Cl. 208-32.000.
Ishida, Nakao; Okada, Tsutomu; and Kamata, Akira, to Mitsubishi Chemical Company, Ltd. 3-(5,7-Dimethyl-2-hydroxy-4-oxo-6,8-decadienyl)-glutarimide fermentation. 3,926,731, Cl. 195-80.00R.
Ishikawa, Hisao: *See*—
Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; Ishikawa, Hisao; Yamada, Shozo; Yasuda, Yasushi; and Asada, Mitsuo, 3,927,034.
Ishiyama, Jiro; and Yokotsuka, Tamotsu, to Kikkoman Shoyu Co., Ltd. Process for producing cyclic-3,5-cytidylic acid by fermentation. 3,926,725, Cl. 195-28.00N.
Ishizuka, Shinichi; and Mihara, Kuniyuki, to Citizen Watch Co., Ltd. Numerical control lathe of sliding-headstock type. 3,926,078, Cl. 82-2.500.
Ishizumi, Kikuo; Mori, Kazuo; Yamamoto, Michihiro; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Ltd. Process for production of quinazoline derivatives. 3,926,993, Cl. 260-251.0QB.
Ismail, Roshdy; Lenz, Arnold; and Termin, Erich, to Dynamit Nobel Aktiengesellschaft. Process for the preparation of phosphorus-containing compounds. 3,927,151, Cl. 260-975.000.
Isojima, Imao; Doi, Yuzuru; and Hara, Shinji, to Mitsui Shipbuilding & Engineering Co. Ltd.; and Kawasaki Steel Corporation. Loading chute for cargo vessel. 3,926,290, Cl. 193-27.000.
ITE Imperial Corporation: *See*—
McConnell, Lorne D., 3,927,350.
Ito, Hiroshi: *See*—
Chibata, Ichiro; Ito, Hiroshi; Morimoto, Tomoaki; Taniguchi, Yukio; and Fujimoto, Tsuneo, 3,926,733.
Itoga, Kiyoshi: *See*—
Aibe, Toshio; Mochida, Seiji; and Itoga, Kiyoshi, 3,926,590.
ITT Industries, Inc.: *See*—
Keller, Hans; and Elmis, Herbert, 3,927,335.
Iturriaga Notario, Luis. Adjusting device for activating brake shoes. 3,926,284, Cl. 188-196.0BA.
Ivanov, Mikhail Ivanovich; From, Anatoly Alexandrovich; Kiseley, Anatoly Efimovich; Nikitenko, Alexandr Alexandrovich; Rusanov, Valentin Mikhailovich; and Skobelev, Leonid Ivanovich. Method of extracting pure serum albumin from biological fluids using a salt of a carboxylic aliphatic acid. 3,926,939, Cl. 260-122.000.
Ives Laboratories Inc.: *See*—
Geller, Ehud, 3,927,194.
Ivy, John B.: *See*—
Willis, Gordon G.; Ivy, John B.; Boozalis, Theodore S.; and Cragar, Darryl E., 3,927,132.
Iwanami, Teruo: *See*—
Fukushima, Mitio; and Iwanami, Teruo, 3,926,876.
Iwasa, Masakazu, to Fuji Photo Film Co., Ltd. Process for making an electrophotographic image by use of photoconductive particles. 3,926,627, Cl. 96-1.00R.
Iwasaki, Takao: *See*—
Kadowaki, Takashi; Iwasaki, Takao; and Matsumura, Hideki, 3,927,130.
Iwasaki Tsushinki Kabushiki Kaisha: *See*—
Nakaya, Naohisa, 3,927,374.
Iwataki, Isao: *See*—
Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; Ishikawa, Hisao; Yamada, Shozo; Yasuda, Yasushi; and Asada, Mitsuo, 3,927,034.
Iwato, Takashi: *See*—
Moriyama, Kazuo; Iwato, Takashi; and Ohno, Morihiko, 3,926,548.
Iwazumi, Tatsuo. Nonlinear filter for detecting electrocardiogram R-waves and other physiological signals. 3,927,377, Cl. 328-167.000.
Izumi, Kenkichi, to Hitachi, Ltd. Multiple-effect multi-stage flash evaporation process and apparatus for demineralizing water. 3,926,739, Cl. 202-173.000.
Izumi, Sumio, to Mitsui Mining & Smelting Co., Ltd. Flotation method for separation of mixture of plastics. 3,926,790, Cl. 209-9.000.
Izumi, Sumio; and Tanaka, Hiroshi, to Mitsui Mining & Smelting Co., Ltd. Flotation method of separation of mixture of plastics. 3,926,791, Cl. 209-9.000.
J. Aichelin, Firma: *See*—
Wunning, Joachim; Bieber, Rolf; and Lustig, Heinz, 3,926,038.
J.I. Case Company: *See*—
Baylor, John M., 3,926,004.
Frisbee, Claude M.; and Baylor, John M., 3,926,263.
Pustelnik, Roy J., 3,925,989.
Jaccard, Roland; Hostettler, Paul; and Siegrist, Rudolf, to Ciba-Geigy AG. Process for performing reactions involving the formation of a solid phase from liquid phase. 3,926,917, Cl. 260-67.60R.
Jackson, Earl K.: *See*—
Pilgram, Kurt H. G.; Jackson, Earl K.; and Kollmeyer, Willy D., 3,927,062.
Jackson, Edgar D.; and Jackson, Thomas E., to Steel Web Corporation. Trussed joist. 3,925,951, Cl. 52-693.000.
Jackson, Thomas E.: *See*—
Jackson, Edgar D.; and Jackson, Thomas E., 3,925,951.
Jackson, Warren M. Flat die thread rolling machine. 3,926,026, Cl. 72-90.000.
Jaclo, Inc.: *See*—
Low, Jack B.; Crist, Buckley; and Zoltner, Thomas J., 3,926,347.
Jacobs, Cornelis Adrianus Joannes: *See*—
Beijer, Louis Benjamin; Driessen, Antonius Jozephus Gerardus Cornelis; and Jacobs, Cornelis Adrianus Joannes, 3,927,343.
Jacobson, Norman: *See*—
Rossi, Albert; Jacobson, Norman; and Miller, Harold N., 3,926,579.
Jacques, Paul E. Paddle ball game apparatus. 3,926,433, Cl. 273-85.00F.
Jaeger, Raymond Edward; and Miller, Thomas John, to Bell Telephone Laboratories, Incorporated. Method for producing particulate material and ceramic bodies therefrom. 3,927,155, Cl. 264-6.000.
Jaekel, Gerhart: *See*—
Gudernatsch, Hugo; Jaekel, Gerhart; Kroll, Wolfgang; Oden, Volker; and Reinhardt, Konrad, 3,926,810.
Jaenicke, Ottokar: *See*—
Strobel, Wolfgang; Jaenicke, Ottokar; Schuddemage, Horst-Dieter; and Jastrow, Horst, 3,927,142.
Janhohen, Veikko. Bracing package. 3,926,364, Cl. 229-55.000.
Janiszewski, Kasimir. Die set with two-part leader pins. 3,926,083, Cl. 83-637.000.
Janssen Pharmaceutica N.V.: *See*—
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 3,927,017.
Janssens, Abraham, to U.S. Philips Corporation. Paging system. 3,927,373, Cl. 325-58.000.
Jantzen, Hermann; Kuffel, Karl; and Puchta, Herbert, to Daimler-Benz Aktiengesellschaft. Shifting linkage for shifting change-speed transmissions. 3,926,068, Cl. 74-473.00R.
Japan Atomic Energy Research Institute: *See*—
Okada, Toshio; Shimano, Yasunao; and Sakurada, Ichiro, 3,926,551.
Jastrow, Horst: *See*—
Strobel, Wolfgang; Jaenicke, Ottokar; Schuddemage, Horst-Dieter; and Jastrow, Horst, 3,927,142.
Jayawant, Madhusudan D., to Du Pont de Nemours, E. I., and Company. Method for making peroxydisulfuric acid and salts thereof. 3,927,189, Cl. 423-513.000.
JBF Scientific Corporation: *See*—
Neal, Robert W., 3,926,812.
Jeffcoat, Keith: *See*—
Flavell, John; and Jeffcoat, Keith, 3,926,016.
Jenn Air Corporation: *See*—
Kurek, Edwin J.; and Cerola, Joseph J., 3,926,171.
Jennings, Gordon Bridgman: *See*—
Johnson, Reginald Francis; Potts, Thomas James; and Jennings, Gordon Bridgman, 3,926,079.
Jensen Corporation: *See*—
Gerstenberger, Roland W.; and Field, William E., 3,926,424.
Jensen, Harald: *See*—
Clauss, Karl; Jensen, Harald; and Luck, Erich, 3,926,976.
Clauss, Karl; Schnabel, Horst; and Jensen, Harald, 3,926,981.
Jensen, Jens S.: *See*—
Hoagland, Amos N.; and Jensen, Jens S., 3,926,465.
Jezo, Maurice Leon Jean, to International Telephone and Telegraph Corporation. Frequency synthesizer. 3,927,384, Cl. 331-2.000.
Jindra, Henri: *See*—
Schulte-Elte, Karl-Heinrich; and Jindra, Henri, 3,927,107.
Jirak, Thomas L.: *See*—
Mulier, Pieter M. J.; Jirak, Thomas L.; and Kane, Lawrence M., 3,927,366.
Joehler, Klaus: *See*—
Davis, Gordon H.; and Joehler, Klaus, 3,927,270.
Joersz, Donald F. Locking device. 3,926,018, Cl. 70-19.000.
Johannes Erhard, H. Waldenmaier Erben Suddeutsche Armaturenfabrik, Firma: *See*—
Forster, Siegmar; and Von Klipstein, Walrath, 3,926,407.
John Edward Butler (New Zealand) Ltd.: *See*—
Nicklin, John Mills, 3,925,853.
John Wyeth & Brother, Ltd.: *See*—
White, Alan Chapman; and Black, Robin Michael, 3,926,994.
John Z. DeLorean Corporation: *See*—
DeLorean, John Z., 3,926,431.
Johndrow, John Paul; and Pallant, Joseph, to H. R. Turner (Willenhall) Limited. Vehicle seats. 3,926,474, Cl. 297-355.000.
Johnson, Arvid B. Apparatus for spreading granulated and pulverized material. 3,926,377, Cl. 239-655.000.
Johnson, Clarence R.; Kidder, Jay T.; and Talarico, Orlando N., to Tilt-A-Bed Corporation, The. Bed and lounge unit. 3,925,834, Cl. 5-13.000.

Johnson, David L.: *See—*
Heldenbrand, Stanley W.; Johnson, David L.; and Mote, Neil H., 3,926,428.

Johnson, Ernest D.: *See—*
Woodling, Gerald L.; Hewitt, John H.; and Johnson, Ernest D., 3,926,296.

Johnson, H. Gordon. Guard for self-propelled sprinkling apparatus. 3,926,372, Cl. 239-177.000.

Johnson, Joel Swenum: *See—*
Elliott, James Francis; and Johnson, Joel Swenum, 3,926,312.

Johnson, John W.; and Selleck, Robert A., to United Technologies Corporation. Sequential helicopter blade ejection system. 3,926,388, Cl. 244-17.110.

Johnson & Johnson: *See—*
Krzewinski, Henrietta K., 3,926,185.
Lee, Henry Lawrence, II; Smith, Francis Fabian; and Swartz, Michael Lawrence, 3,926,906.
Shultz, Jay S., 3,927,236.
Tritsch, Ludwig, 3,926,190.
Tritsch, Ludwig, 3,926,191.

Johnson, Lee W., to Reell Precision Manufacturing Corporation. Spring grip clutch. 3,926,286, Cl. 192-41.00S.

Johnson, Norman F., to United States of America, Navy. Deep ocean parachute release. 3,926,137, Cl. 114-209.000.

Johnson, Reginald Francis; Potts, Thomas James; and Jennings, Gordon Bridgman, to Rolls-Royce (1971) Limited. Machine tools. 3,926,079, Cl. 82-36.00A.

Johnson Service Company: *See—*
Bechtel, Jon Harold, 3,926,052.

Johnston, Chester C., Jr.: *See—*
Hessert, James E.; and Johnston, Chester C., Jr., 3,926,258.

Jones, Freeman B., Jr.; and Ratto, Joseph J., to Rockwell International Corporation. Low melting point disubstituted-p,p'-phenyl cinnamate liquid crystals. 3,926,834, Cl. 252-299.000.

Jones, John L.; Rubino, Andrew M.; and Lindahl, Charles B., to Armour Pharmaceutical Company. Zirconium complexes of basic aluminum bromides and methods of making same. 3,927,188, Cl. 423-463.000.

Jones & Laughlin Steel Corporation: *See—*
Aronson, Arthur H.; and Rarey, Charles R., 3,926,624.

Jones, Robert E.: *See—*
Gilbert, Eugene C.; Jones, Robert E.; McLean, Donald C.; and Sherman, Edward, 3,927,106.

Jones, Robert J.; and Cassey, Howard N., to TRW Inc. Low temperature curing polyimides. 3,926,913, Cl. 260-47.0CP.

Jones, Robert J.; and Green, Howard E., to TRW Inc. Bis(furfuryl) imide. 3,927,027, Cl. 260-326.00S.

Jones, Robert T., to Monsanto Company. Phenolic resin and battery separator impregnated therewith. 3,926,679, Cl. 136-146.000.

Jones, Ronald E.: *See—*
Chiou, Jackson K. S.; and Jones, Ronald E., 3,927,102.

Jones, Roosevelt J. Multi-column fractionator. 3,926,809, Cl. 210-198.00C.

Jones, Thomas E.: *See—*
Burke, William F.; Crowell, Lee T.; Greenwood, Robert C.; and Jones, Thomas E., 3,926,291.

Jonville, Pierre; Stohr, Helmut; Beccu, Klaus D.; and Baronnet, Rene, to Battelle Memorial Institute. Method of manufacturing electrical connection elements for supporting electrodes for storage cells. 3,926,674, Cl. 136-36.000.

Jordan, John E.; and Newcombe, George M., to United States of America, Tennessee Valley Authority and the Environmental Protection Agency. Sulfur dioxide removal from stack gases. 3,927,178, Cl. 423-242.000.

Jouffret, Michel: *See—*
Bourdin, Francois; Chizat, Francois; Costantini, Michel; and Jouffret, Michel, 3,927,122.
Bourdin, Francois; Chizat, Francois; Costantini, Michel; and Jouffret, Michel, 3,927,123.

Juillet, Jean-Marc G. Artificial tooth implant device. 3,925,892, Cl. 32-10.00A.

Jungles, John; Whitehouse, David John; and Nightingale, Eric Gordon, to Rank Organisation Ltd., The. Optical diffractometers. 3,927,253, Cl. 178-6.800.

Junike, Wilhelm August Karl; and Koch, Hans-Joachim, to Max Muller Brinker Maschinenfabrik Zweigniederlassung der Gildemeister Aktiengesellschaft. Apparatus for changing the tool holders carrying mounted tools on a machine tool. 3,925,877, Cl. 29-568.000.

Jurid Werke GmbH: *See—*
Augustin, Wilfried, 3,927,241.

Jury, Gene R. Furnace and cold air return systems. 3,926,173, Cl. 126-110.00R.

Kablaoui, Mahmoud S.; and Duranleau, Roger G., to Texaco Inc. Preparation of alkylamides. 3,927,049, Cl. 260-404.000.

Kabushiki Kaisha Suwa Seikosha: *See—*
Maezawa, Shuji, 3,925,977.
Naito, Okito, 3,925,978.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Komatsu, Noboru; Kurauchi, Toshio; Murase, Makoto; and Negi, Kazuhiko, 3,926,866.

Kado, Masaru: *See—*
Konnai, Makoto; Kamata, Hiroshi; and Kado, Masaru, 3,926,612.

Kadono Chemical Laboratory Co., Ltd.: *See—*
Kadono, Yahiko; and Kadono, Yanosuke, 3,927,226.

Kadono, Yahiko; and Kadono, Yanosuke, to Kadono Chemical Laboratory Co., Ltd. Method of treating copied plans. 3,927,226, Cl. 427-140.000.

Kadono, Yanosuke: *See—*
Kadono, Yahiko; and Kadono, Yanosuke, 3,927,226.

Kadowaki, Takashi; Iwasaki, Takao; and Matsumura, Hideki, to Denki Kagaku Kogyo Kabushiki Kaisha. Method of isomerizing dichlorobutenes. 3,927,130, Cl. 260-654.00R.

Kaelin, Bette M.: *See—*
Breslow, Jeffrey D.; and Kaelin, Bette M., 3,926,438.

Kagi, Dieter: *See—*
Furst, Andor; Buchschacher, Paul; Kagi, Dieter; Meier, Werner; Muller, Marcel; and Widmer, Erich, 3,927,032.

Kalafatas, Nicholas J.; Rosenthal, Harold; and Consolazio, George A., to General Foods Corporation. Cold water-soluble gelatin composition and process of preparing same. 3,927,221, Cl. 426-576.000.

Kalakowsky, Charles B.: *See—*
Stahmann, James R.; and Kalakowsky, Charles B., 3,926,386.

Kali und Salz Aktiengesellschaft: *See—*
Effmert, Alexander; and Neitzel, Ulrich, 3,926,609.

Kallay, Victor Paul: *See—*
Geiger, Kenneth Daniel; Horvath, Steven Joseph; Kallay, Victor Paul; Seymour, Theodore Joseph; Watson, Thorpe Wesley; and Zervoudis, John, 3,926,247.

Kamata, Akira: *See—*
Ishida, Nakao; Okada, Tsutomu; and Kamata, Akira, 3,926,731.

Kamata, Hiroshi: *See—*
Konnai, Makoto; Kamata, Hiroshi; and Kado, Masaru, 3,926,612.

Kamiyama, Fumio: *See—*
Shibata, Yutaka; Kodera, Yoshiaki; Tanaka, Mitsuru; Kamiyama, Fumio; and Nakatan, 3,926,918.

Kanaby, Randel R., to General Motors Corporation. Method for producing directionally solidified cast alloy articles and apparatus therefor. 3,926,245, Cl. 164-53.000.

Kane, Lawrence M.: *See—*
Mulier, Pieter M. J.; Jirak, Thomas L.; and Kane, Lawrence M., 3,927,366.

Kaneko, Yasuhisa: *See—*
Niimi, Itaru; Kaneko, Yasuhisa; Noda, Fumiyoshi; and Tsuzuki, Yoshihiro, 3,927,181.

Kanno, Hideo: *See—*
Sugai, Tetuya; Soga, Hiromu; Motegi, Masayosi; and Kanno, Hideo, 3,927,394.

Kano, Masafumi: *See—*
Tsugukuni, Hideyoshi; Kano, Masafumi; and Matsuda, Mitsuhiro, 3,926,875.

Kanoh, Natsuki: *See—*
Enokido, Nobuo; Murakami, Atsushi; Yamaguchi, Kazuo; Kanoh, Natsuki; Tanaka, Toru; Okano, Shigeaki; and Suzuki, Masatoshi, 3,926,929.

Kansai Paint Company, Limited: *See—*
Sera, Katsuya; and Kasari, Akira, 3,926,761.

Kansas University Endowment Association: *See—*
Fox, J. Eugene; and McChesney, James D., 3,926,949.

Kanzaki, Toshihiko; Fujisawa, Yukio; Shirafuji, Hideo; Nara, Kiyoshi; and Yoneda, Masahiko, to Takeda Chemical Industries, Ltd. Method for producing deacetylcephalosporin C. 3,926,729, Cl. 195-36.00C.

Karayannis, Nicholas M.; Khelghatian, Missak; and Lee, Sam S., to Standard Oil Company. Catalyst and process for the polymerization of alpha-olefins. 3,926,928, Cl. 260-88.200.

Kareman, James. Combination saw and filing blade for use with jig or sabre saw. 3,925,867, Cl. 29-78.000.

Kasai, Yujiro: *See—*
Kodama, Koji; and Kasai, Yujiro, 3,927,365.

Kasari, Akira: *See—*
Sera, Katsuya; and Kasari, Akira, 3,926,761.

Kase, Heino; Marshall, Edward W.; and Kirtikar, Survrat, to Varian Associates. Multistage thin film toning system for developing charged images. 3,927,409, Cl. 346-74.0ES.

Kashio, Toshio, to Casio Computer Co., Ltd. Control device for tabulation printing. 3,927,395, Cl. 340-172.500.

Katamoto, Kazuyoshi: *See—*
Nara, Kiyoshi; Ohta, Kazuhiko; Katamoto, Kazuyoshi; Mizokami, Nariakira; and Fukuda, Hideo, 3,926,973.

Kato, Tomotake: *See—*
Yoshikawa, Yoshio; Sugio, Akitoshi; Kato, Tomotake; and Okazaki, Heizo, 3,927,190.

Kato, Yoshiki: *See—*
Shimada, Toshikazu; Komatsubara, Kiichi; Hasegawa, Susumu; and Kato, Yoshiki, 3,926,682.

Katori, Tatsuhiko; Sato, Giichi; Kihara, Takashi; Yumoto, Norio; Makino, Shigeru; and Harada, Juntaro, to SS Pharmaceutical Co., Ltd. 2-Alkoxybenzoylamino acids. 3,927,082, Cl. 260-519.000.

Katsura, Masaki: *See—*
Ichinose, Noboru; Yokomizo, Yuhji; and Katsura, Masaki, 3,926,858.

Katsura Roller Mfg. Co., Ltd.: *See—*
Nishiwaki, Hiroshi, 3,926,701.

Katz, Harry Selig. Method of making a disposable dental floss tooth pick. 3,926,201, Cl. 132-91.000.

Katzman, Oded. Frost protection plug for a water meter. 3,926,051, Cl. 73-277.000.

Kauferle, Josef: *See—*
Gail, Josef; and Kauferle, Josef, 3,925,930.

Kaufman, Irving, to United States of America, Air Force. Syst m for electronic adjustment of effective contrast ratio in photographic reproduction. 3,926,520, Cl. 355-80.000.

Kawabata, Hidetsugu; and Yamashita, Tadaoki, to Matsushita Electric Industrial Co., Ltd. Dosimetry method. 3,927,328, Cl. 250-473.000.

Kawamata, Toshio: *See*—
Ogura, Shuichi; Chow, Hirotsura; and Kawamata, Toshio, 3,927,244.

Kawamoto, Hirohisa; Prager, Hans John; and Risko, John Joseph, to RCA Corporation. Method of making a double diffused trapatt diode. 3,926,693, Cl. 148-175.000.

Kawamura, Kotaro: *See*—
Hayashi, Kenji; Yumde, Yasufumi; and Kawamura, Kotaro, 3,927,420.

Kawasaki, Iwao: *See*—
Fujita, Yukio; Kawasaki, Iwao; and Nishikawa, Hideo, 3,926,796.

Kawasaki Steel Corporation: *See*—
Isojima, Imao; Doi, Yuzuru; and Hara, Shinji, 3,926,290.

Kawata, Shigeo: *See*—
Yoshimura, Yoshio; Yokogawa, Kanae; and Kawata, Shigeo, 3,927,200.

Kayano, Tatsuo: *See*—
Yoshino, Takehiko; Yanagimachi, Akio; Uehara, Takashi; Takezawa, Teruhiro; Fukuda, Masaaki; and Kayano, Tatsuo, 3,927,269.

Kaye, Saul, to Ferro Corporation. Treatment of organic biodegradable materials with monochloroacetate esters of chlorinated phenols. 3,926,644, Cl. 106-15.0AF.

Keegan, James J.; Patel, Girish; and Rubin, Howard, to Warner-Lambert Company. Denture adhesive preparation containing an anionic protein material. 3,926,870, Cl. 260-8.000.

Keil, Joseph W., to Dow Corning Corporation. Siloxane-modified epoxy resin compositions. 3,926,885, Cl. 260-29.1SB.

Keller, Hans; and Elmis, Herbert, to ITT Industries, Inc. Monolithic integrable series stabilization circuit. 3,927,335, Cl. 307-296.000.

Kelley, Don Howard: *See*—
Quock, Billy; Kelley, Don Howard; Warneke, Sehon Lester; and Gurgiolo, Arthur E., 3,926,867.

Kelley, John Joseph; and Varker, Alan Edward, to ESB Incorporated. Epoxy resin-amine salt emulsion composition. 3,926,886, Cl. 260-29.2EP.

Kelley, Zar W., to Beck, Louis. Pump having spring-loaded piston shaft assembly. 3,925,988, Cl. 60-539.000.

Kelly, James G., to American Brands, Inc. Method and apparatus for drying stillage. 3,925,904, Cl. 34-10.000.

Kemmenoe, Adrian Victor: *See*—
Ferres, Harry; Kemmenoe, Adrian Victor; and Best, Desmond John, 3,926,960.

Kennedy, John B., Jr.: *See*—
O'Neill, Roger M.; and Kennedy, John B., Jr., 3,926,337.

Kennedy, Patrick Hayes. Inflatable life preserver. 3,925,838, Cl. 9-319.000.

Kenny, Edwin J. Combination cutlery and cutting board. 3,926,419, Cl. 269-16.000.

Kenton, Joseph R., to Phillips Petroleum Company. Removal of fertilizer precipitate. 3,926,610, Cl. 71-34.000.

Kercher, Dean S.; and Rod, Trygve R., to Xerox Corporation. Quick change labeling head. 3,926,352, Cl. 226-79.000.

Kerman, Stephen: *See*—
Tsutsumi, Fumio; and Kerman, Stephen, 3,927,278.

Kernforschungsanlage JULICH GmbH: *See*—
Luhleich, Hartmut; Nickel, Hubertus; and Dias, Francesco, 3,927,187.

Kerr Glass Manufacturing Corporation: *See*—
Cistone, David R., 3,926,328.

Keyes, Melvin H.: *See*—
Gray, Don N.; Keyes, Melvin H.; and Semersky, Frank E., 3,926,734.

Keylwert, Johann, to Klockner-Humboldt-Deutz AG. Rotary piston combustion engine. 3,926,151, Cl. 123-8.050.

Keyser, Naaman H.; and Mertdogan, Akgun, to Interlake, Inc. Process for purification of manganese alloys. 3,926,623, Cl. 75-129.000.

Keyworth, Donald A.: *See*—
Turnbo, Roy Glen; and Keyworth, Donald A., 3,927,176.

Kharouf, Issa J.: *See*—
Brendlinger, Edward C.; Higgs, Richard F.; and Kharouf, Issa J., 3,926,767.

Khelghatian, Missak: *See*—
Karayannis, Nicholas M.; Khelghatian, Missak; and Lee, Sam S., 3,926,928.

Kholodovskaya, Rakhil Samoilovna: *See*—
Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovidh; Zakharova, Nina Vasilievna; Golubenko, Mikhail Afanasievich; Tolstikov, Genrikh Alexandrovich; Kholodovskaya, Rakhil Samoilovna; Shalimova, Zoya Stepanovna; Legostaeva, Taisia Vasilievna; Popov, Vasily Dmitrievich; and Dolidze, Vladimir Romanovich, 3,927,038.

Kidder, Jay T.: *See*—
Johnson, Clarence R.; Kidder, Jay T.; and Talarico, Orlando N., 3,925,834.

Kiesewetter, Erwin; and Herrling, Siegfried. Preparation of salts of carboxylic acids containing a beta-lactam groups. 3,926,954, Cl. 260-239.100.

Kifer, James M.: *See*—
Sisco, Willie J., Jr.; Long, Cecil L.; and Kifer, James M., 3,926,652.

Kihara, Takashi: *See*—
Katori, Tatsuhiko; Sato, Giichi; Kihara, Takashi; Yumoto, Norio; Makino, Shigeru; and Harada, Juntaro, 3,927,082.

Kihara, Toshiyuki, to Yoshida Kogyo Kabushiki Kaisha. Slider for a slide fastener. 3,925,857, Cl. 24-205.15R.

Kikkoman Shoyu Co., Ltd.: *See*—
Ishiyama, Jiro; and Yokotsuka, Tamotsu, 3,926,725.

Kikuchi, Makoto, to Toyoda-Koki Kabushiki-Kaisha. Grinding machine with an automatic exchange device for grinding wheels. 3,925,878, Cl. 29-568.000.

Kim, Sunyong P. Portable shower. 3,925,828, Cl. 4-147.000.

Kimberly-Clark Corporation: *See*—
Pierce, Allan A.; Peterson, Christian M.; and Kunde, Jerry G., 3,926,425.

Kimura, Shuji; and Takahata, Kouichi, to Nippon Kogaku K. K. Motor-driven device for use in a long film strip magazine. 3,927,413, Cl. 354-173.000.

King, Peter Graham: *See*—
Fogg, Sidney George; King, Peter Graham; and Yeoman, Elfed, 3,926,877.

Kinnicutt, Roger, Jr.: *See*—
Sieurin, Donald; and Kinnicutt, Roger, Jr., 3,926,382.

Kinoshita, Minoru; and Taniuchi, Osami, to LogEtronics Inc. Automatic film processor replenishment system. 3,927,417, Cl. 354-298.000.

Kirtikar, Survrat: *See*—
Kase, Heino; Marshall, Edward W.; and Kirtikar, Survrat, 3,927,409.

Kirwin, James M.: *See*—
Haase, Elmer A.; and Kirwin, James M., 3,926,162.

Kiseley, Anatoly Efimovich: *See*—
Ivanov, Mikhail Ivanovich; From, Anatoly Alexandrovich; Kiseley, Anatoly Efimovich; Nikitenko, Alexandr Alexandrovich; Rusanov, Valentin Mikhailovich; and Skobelev, Leonid Ivanovich, 3,926,939.

Kister, Ronald R. Panel handling device and method. 3,926,318, Cl. 214-1.00H.

Kitaoka, Atsushi: *See*—
Aishima, Itsuho; Kitaoka, Atsushi; Koseki, Toshinori; Suzuki, Sachio; Arimoto, Kenji; and Matsumoto, Koichi, 3,926,873.

Kittredge, Lloyd G.: *See*—
Hubbard, David W.; and Kittredge, Lloyd G., 3,926,110.

Kiyonaga, Kingo; and Murakawa, Yoshiyuki, to Hitachi Metals, Ltd. Pitting resisting alloy steels. 3,926,622, Cl. 75-126.00G.

Kjellberg, Jonas F., to SKF Industrial Trading and Development Company B.V. Harrow device. 3,926,261, Cl. 172-688.000.

Klatt, Alfred, to WABCO Westinghouse GmbH. Anti-locking vehicle brake system for individual wheel control. 3,926,477, Cl. 303-21.00P.

Klein, George I., to Stauffer Chemical Company. Process for manufacturing phosphorus oxychloride. 3,927,179, Cl. 423-300.000.

Kleiner, Eduard K., to Ciba-Geigy Corporation. Atomized spray dispenser with improved atomization. 3,926,343, Cl. 222-145.000.

Klementi, Toe Jokhannesovich; Herem, Henn-Jaak Eerovich; and Skornyakov, Eduard Petrovich. Device and method for separation of fluid mixture into fractions in a chromatograph. 3,926,589, Cl. 55-67.000.

Kliment, Karel; and Tu, Robert S., to National Patent Development Corporation. Hydrophilic root canal filling material. 3,925,895, Cl. 32-15.000.

Klingler, Thomas C.: *See*—
Goralski, Christian T.; and Klingler, Thomas C., 3,927,090.

Klockner-Humboldt-Deutz AG: *See*—
Keylwert, Johann, 3,926,151.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Wagner, Gerhard, 3,925,840.

Klunsch, Maximilian; Lingens, Paul; and Ratz, Heinz, to Dynamit Nobel Aktiengesellschaft. Explosive composition and eutectic mixture therefor. 3,926,696, Cl. 149-2.000.

Klygis, Mindaugas Julius, to Illinois Tool Works Inc. Bottle carrier. 3,926,307, Cl. 206-153.000.

Knepler, John T., to Dickey-john Corporation. Efficiency monitoring system for seed planting apparatus. 3,927,400, Cl. 340-276.000.

Knipper, Aloysius J.: *See*—
Rosenquest, Allen H.; Knipper, Aloysius J.; and Wood, Robert W., 3,927,222.

Knoch, Werner: *See*—
Evers, Heinz; and Knoch, Werner, 3,926,807.

Knoll A.G. Chemische Fabriken: *See*—
Dengel, Ferdinand; Ehrmann, Oskar; Friedrich, Ludwig; and Zimmermann, Frank, 3,926,995.

Knopf, Werner; and Liebscher, Harald, to VEB Kombinat Nagema. Apparatus for compacting contents of containers. 3,925,962, Cl. 53-124.00B.

Knorr-Bremse GmbH: *See*—
Preller, Fritz; and Prahl, Franz, 3,926,285.

Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans-Georg, to Eisenwerk-Gesellschaft Maximilianshutte mgH. Process for refining low-phosphorus pig iron to make steel. 3,926,618, Cl. 75-60.000.

Kobayashi, Takashi: *See*—
Nakajima, Eiichi; Morioka, Tadashi; Kurihara, Kozo; and Kobayashi, Takashi, 3,926,817.

Kobe, Inc.: *See*—
Erickson, John W., 3,926,534.

Kobe Steel, Ltd.: *See—*
Ichikawa, Yoshihiro; Fujisawa, Tetsuo; and Seo, Yoshiro, 3,926,651.

Kobylak, Anthony M.: *See—*
Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V., 3,927,342.

Koch, Hans-Joachim: *See—*
Junike, Wilhelm August Karl; and Koch, Hans-Joachim, 3,925,877.

Kocsis, Joseph: *See—*
Cauge, Thomas P.; and Kocsis, Joseph, 3,926,694.

Kodama, Koji; and Kasai, Yujiro, to Tokyo Shibaura Electric Co., Ltd. Switch operating device. 3,927,365, Cl. 323-48.000.

Kodera, Yoshiaki: *See—*
Shibata, Yutaka; Kodera, Yoshiaki; Tanaka, Mitsuru; Kamiyama, Fumio; and Nakatan, 3,926,918.

Koenig, Peter J.: *See—*
Meier, Walter; Zeller, Josef; Koenig, Peter J.; Bruderer, Werner; and Schmid, Markus, 3,926,244.

Kogure, Katsura; Koyama, Hiroyasu; and Nakagawa, Kunio, to Nisshin Flour Milling Co., Ltd. Process for the production of 2(4-alkylphenyl)propionic acid. 3,927,084, Cl. 260-523.00A.

Kohata, Mamoru: *See—*
Takayama, Kenichiro; Adachi, Tetsuo; Kohata, Mamoru; Hattori, Kiyoji; and Tomiyama, Tomoko, 3,926,724.

Kohlmuller, Gerlind: *See—*
Kohlmuller, Hans; and Kohlmuller, Gerlind, 3,926,675.

Kohlmuller, Hans; and Kohlmuller, Gerlind, to Siemens Aktiengesellschaft. Process for making electrodes containing Raney nickel and a thiocyanate. 3,926,675, Cl. 136-86.00E.

Koike, Makiko: *See—*
Kondo, Shinichi; Sezaki, Masaji; Koike, Makiko; Shimura, Masaru; Akita, Eiichi; Satoh, Kimio; Hamamoto, Kazuko; Niida, Taro; and Hara, Takeshi, 3,926,948.

Kolenik, Steve A., to ARCO Medical Products Company. Cardiac pacer. 3,926,198, Cl. 128-419.0PG.

Kollmeyer, Willy D.: *See—*
Pilgram, Kurt H. G.; Jackson, Earl K.; and Kollmeyer, Willy D., 3,927,062.

Kolm, Jan: *See—*
Baklien, Asbjorn; and Kolm, Jan, 3,927,097.

Koloc, Paul M., to United States of America, Navy. Video phosphor motion perception display. 3,927,323, Cl. 250-329.000.

Komatsu, Noboru; Kurauchi, Toshio; Murase, Makoto; and Negi, Kazuhiko, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Process for production of rigid polyurethane foam and product for use as energy absorbing material. 3,926,866, Cl. 260-2.5AH.

Komatsubara, Kiichi: *See—*
Shimada, Toshikazu; Komatsubara, Kiichi; Hasegawa, Susumu; and Kato, Yoshiki, 3,926,682.

Komor, Joseph A.: *See—*
O'Neill, John J.; Komor, Joseph A.; Babcock, Thomas E.; Edmundson, Robert J.; and Shay, Edward G., 3,926,828.

Konan Electric Company, Ltd.: *See—*
Ohishi, Masateru, 3,926,217.

Konas, William W.; Day, Paul L.; and Budzinski, Roger R., to Park-Ohio Industries Inc. Method and apparatus for carbonizing and degassing workpieces. 3,926,415, Cl. 266-5.00E.

Kondo, Eiji; and Mitsugi, Takashi, to Shionogi & Co., Ltd. New process for the preparation of 6-Aminopenicillanic acid. 3,926,728, Cl. 195-36.00P.

Kondo, Shinichi; Sezaki, Masaji; Koike, Makiko; Shimura, Masaru; Akita, Eiichi; Satoh, Kimio; Hamamoto, Kazuko; Niida, Taro; and Hara, Takeshi, to Meiji Seika Kaisha, Ltd. Antibiotics destomycin A and B and a method for producing same using streptomyces rimofaciens. 3,926,948, Cl. 260-210.0AB.

Kondo, Takasi: *See—*
Hayashi, Makoto; Hinata, Masanori; Yokota, Minoru; and Kondo, Takasi, 3,926,023.

Kondo, Toshiyuki: *See—*
Shibatani, Juichi; and Kondo, Toshiyuki, 3,926,480.

Kondo, Yoshizi. Gripper for use with a lifting apparatus for gripping an article desired to be lifted. 3,926,468, Cl. 294-102.00R.

Konnai, Makoto; Kamata, Hiroshi; and Kado, Masaru, to Kumiai Chemical Industry Co., Ltd. Herbicidal composition containing S-(2-chlorobenzyl)-N,N-di-isopropylthiocarbamate. 3,926,612, Cl. 71-100.000.

Konrad, Charles Edward, to General Electric Company. Electric vehicle power circuit. 3,927,357, Cl. 318-139.000.

Kopito, Louis; Schuster, Samuel R.; and Kosasky, Harold, to Ovutime, Inc. Processes and devices for determining properties of bodily mucus. 3,926,037, Cl. 73-53.000.

Koppel, Gary A., to Eli Lilly and Company. Process for preparing 3-fluorocephalosporins. 3,926,978, Cl. 260-243.00C.

Korbonits, Dezso; Harsanyi, Kalman; Molnar nee Bako, Erzsebet; Takacs, Kalman; Heja, Gergely; Bodnar, Janos; Bodrogi, Istvan; and Erodi, Judit. 3-Amino-Δ^3-pyrazoline derivatives and process for the preparation thereof. 3,927,025, Cl. 260-310.00D.

Korth, Hans Erdmann: *See—*
Frosch, Albert; and Korth, Hans Erdmann, 3,926,500.

Kosasky, Harold: *See—*
Kopito, Louis; Schuster, Samuel R.; and Kosasky, Harold, 3,926,037.

Koseki, Toshinori: *See—*
Aishima, Itsuho; Kitaoka, Atsushi; Koseki, Toshinori; Suzuki, Sachio; Arimoto, Kenji; and Matsumoto, Koichi, 3,926,873.

Koshar, Robert J.; Husted, Donald R.; Wright, Charles D.; and Zollinger, Joseph La Mar, to Minnesota Mining and Manufacturing Company. Difluoroamino compounds. 3,927,103, Cl. 260-584.00C.

Koshi, Masao: *See—*
Tanaka, Eiichiro; Nishimura, Katsuo; Shimizu, Hiroshi; and Koshi, Masao, 3,926,502.

Koshiba, Masao: *See—*
Ishizumi, Kikuo; Mori, Kazuo; Yamamoto, Michihiro; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 3,926,993.

Kostelezky, Walter: *See—*
Paul, Jurgen; Kostelezky, Walter; and Schwerdt, Paul, 3,927,339.

Kostka, Hana, to Siemens Aktiengesellschaft. Catalyst and process for the conversion of higher hydrocarbons. 3,926,850, Cl. 252-455.00R.

Kostromin, Alexandr Stepanovich: *See—*
Andreikov, Evgeny Iosifovich; Kostromin, Alexandr Stepanovich; and Rusyanova, Natalya Dmitrievna, 3,927,040.

Kotulak, Ludovit; and Svantner, Jiri, to Ceskoslovenska akademie ved. Apparatus for measurement of volumetric changes during chemical reactions, namely oxidation reactions. 3,926,563, Cl. 23-255.00E.

Kowaka, Masamichi; and Fujikawa, Hisao, to Sumitomo Metal Industries Ltd. Low carbon Ni-Cr alloy steel having an improved resistance to stress corrosion cracking. 3,926,620, Cl. 75-122.000.

Kowal, Leonard J., to Imperial-Eastman Corporation. Tube bender. 3,926,028, Cl. 72-319.000.

Koyama, Hiroyasu: *See—*
Kogure, Katsura; Koyama, Hiroyasu; and Nakagawa, Kunio, 3,927,084.

Koyama, Masao: *See—*
Fujiwara, Susumu; Okada, Takao; Koyama, Masao; Akashi, Hiromitsu; and Nishikawa, Yoichi, 3,927,309.

Koyanagi, Shunichi; Arai, Shigeru; Tajima, Shigenobu; and Kurimoto, Kazuhiko, to Shinetsu Chemical Company. Method for suspension-polymerizing vinyl chloride. 3,926,931, Cl. 260-92.80W.

Koziol, Konrad; Rathjen, Hans-Carl; and Sieberer, Karl-Heinz, to C. Conradty, Firma. Metal anode for electrochemical processes and method of making same. 3,926,773, Cl. 204-290.00F.

Kozy, Michael J.: *See—*
Gaudet, Ronald M.; Michell, Samuel S.; and Kozy, Michael J., 3,926,806.

Kracklauer, John J., to Syntex (U.S.A.) Inc. Flexible polyvinyl chloride plastics having improved flame retardancy and reduced smoke generating. 3,926,881, Cl. 260-28.50D.

Krapcho, John; and Turk, Chester Frank, to E. R. Squibb & Sons, Inc. Substituted pyrazolo[4,3-c]pyridine compounds. 3,926,968, Cl. 260-240.00R.

Krapcho, John; and Turk, Chester Frank, to E. R. Squibb & Sons, Inc. Substituted pyrazoles. 3,926,988, Cl. 260-247.5EP.

Krenowicz, Robert A.: *See—*
Durr, Albert M.; and Krenowicz, Robert A., 3,926,823.

Krey, Winfried: *See—*
Bauer, Jakob; and Krey, Winfried, 3,926,680.

Krikau, Frederick G., to Interlake, Inc. Control of coke oven door emissions. 3,926,740, Cl. 202-261.000.

Kristiansen, Odd, to Ciba Geigy Corporation. O-(methyl or ethyl)-O(S) lower alkyl-O-(4-phenoxyphenyl)phosphates. 3,927,149, Cl. 260-951.000.

Kroll, Wolfgang: *See—*
Gudernatsch, Hugo; Jaekel, Gerhart; Kroll, Wolfgang; Oden, Volker; and Reinhardt, Konrad, 3,926,810.

Kronstadt, Victor, to Mack Trucks, Inc. Vehicle automatic transmission having push start capability. 3,926,075, Cl. 74-867.000.

Krueger, Robert H.: *See—*
Albertson, Clarence E.; and Krueger, Robert H., 3,926,818.

Krumme, Werner, to Wean United, Inc. Roll changing apparatus for a rolling mill or the like. 3,926,027, Cl. 72-239.000.

Krupp, Joseph: *See—*
Merker, George; Krupp, Joseph; Ricards, Charles R.; and Ward, Thomas A., 3,926,423.

Krusche, Edwin C.: *See—*
Breyer, Frederick; Davis, George T.; and Krusche, Edwin C., 3,926,146.

Krzewinski, Henrietta K., to Johnson & Johnson. Surgical drape. 3,926,185, Cl. 128-132.00D.

Kudashov, Vasily Yakovlevich: *See—*
Orlov, Petr Nikolaevich; Nesterov, Jury Ivanovich; Kudashov, Vasily Yakovlevich; Zimnyakov, Alexandr Vasilievich; Ermakova, Irina Nikolaevna; Bogomolov, Igor Vasilievich; Nirman, Efim Matveevich; and Sokolov, Vladimir Dmitrievich, 3,925,936.

Kuffel, Karl: *See—*
Jantzen, Hermann; Kuffel, Karl; and Puchta, Herbert, 3,926,068.

Kugler Fonderie et Robinetterie S.A.: *See—*
Mahrer, Francois-Regis, 3,926,220.

Kuhla, Donald E., to Pfizer Inc. Process for producing quinoxaline-di-N-oxides. 3,926,991, Cl. 260-250.00Q.

Kuhn, Hans H.: *See—*
Foster, Larry R.; and Kuhn, Hans H., 3,927,044.

Kuhr, Albert F.: *See—*
Balinski, Henry A.; and Kuhr, Albert F., 3,925,946.

Kumiai Chemical Industry Co., Ltd.: *See—*
Konnai, Makoto; Kamata, Hiroshi; and Kado, Masaru, 3,926,612.

Kunde, Jerry G.: *See—*
Pierce, Allan A.; Peterson, Christian M.; and Kunde, Jerry G., 3,926,425.

Kunimine, Isao, to Nippon Tsu Shin Kogyo K.K.; and TIE/communications, Inc. Interlocking bar allowing operation of one switch assembly in a plural column, row matrix switch assembly. 3,927,283, Cl. 200-5.00R.

Kunkle, Gerald E., to PPG Industries, Inc. Method and apparatus for forming a ribbon of glass on a molten metal bath. 3,926,605, Cl. 65-65.00A.

Kunne, Kurt; and Wittkopp, Fritz, to Siemens Aktiengesellschaft. X-ray examining apparatus. 3,927,326, Cl. 250-447.000.

Kuntz, Irving, to Exxon Research & Engineering Co. Novel polymers of olefins and polar monomers. 3,926,925, Cl. 260-78.50R.

Kuper, Wilfried: *See*—
Rall, Ulrich; Mahall, Karl; and Kuper, Wilfried, 3,927,229.

Kupferman, Zelig, to United States of America, Navy. Wettable fire fighters' garment. 3,925,823, Cl. 2-81.000.

Kurauchi, Toshio: *See*—
Komatsu, Noboru; Kurauchi, Toshio; Murase, Makoto; and Negi, Kazuhiko, 3,926,866.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Yoshikawa, Shinsuke; Endo, Hiroyuki; and Terasaki, Shuji, 3,927,156.

Kurek, Edwin J.; and Cerola, Joseph J., to Jenn Air Corporation. Base for a ventilated cooking range. 3,926,171, Cl. 126-21.00A.

Kurichh, Sham L.; and Acre, Leon R., to Midland-Ross Corporation. Air operated spring brake. 3,926,094, Cl. 92-63.000.

Kurihara, Kozo: *See*—
Nakajima, Eiichi; Morioka, Tadashi; Kurihara, Kozo; and Kobayashi, Takashi, 3,926,817.

Kurimoto, Kazuhiko: *See*—
Koyanagi, Shunichi; Arai, Shigeru; Tajima, Shigenobu; and Kurimoto, Kazuhiko, 3,926,931.

Kurth, Harald; Laube, Dieter; and Berthold, Erich, to VEB Wirkmaschinenbau Karl-Marx-Stadt. Cam systems for circular knitting machines. 3,926,013, Cl. 66-40.000.

Kushnir, Bud W.: *See*—
Fustukian, David A. W.; Kushnir, Bud W.; Norris, Leon F.; and Fraser, Robert W., 3,926,691.

Kusters, Eduard: *See*—
Ahrweiler, Karl-Heinz, 3,926,542.

Kutch, Edward F.: *See*—
Meyers, Robert M.; Kutch, Edward F.; and Sitter, Matthew M., 3,925,947.

Kuwada, Yutaka; Meguro, Kanji; and Tawada, Hiroyuki, to Takeda Chemical Industries, Ltd. 2-(3-Hydroxyaminomethyl-S-triazol-4-yl)benzophenones. 3,927,015, Cl. 260-308.00R.

Kyberna GmbH: *See*—
Callies, Dieter; Frank, Gunter; and Graf vom Hagen, Siegbert, 3,926,557.

Kyburz, Emilio; and Spiegelberg, Hans, to Hoffmann-La Roche Inc. Tricyclic amines and processes for the preparation thereof. 3,927,128, Cl. 260-649.00R.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Takayama, Kenichiro; Adachi, Tetsuo; Kohata, Mamoru; Hattori, Kiyoji; and Tomiyama, Tomoko, 3,926,724.

Kyowa Kagakukogyo Kabushiki Kaisha: *See*—
Shigeo, Nozawa, 3,925,926.

Kyrias, Gilbert M., to FMC Corporation. Method and apparatus for bubble shearing. 3,927,152, Cl. 261-122.000.

L. H. Frost and Company, Inc.: *See*—
Frost, Louis H.; and Powers, Walter H., 3,927,285.

Laabs, Johannes: *See*—
Harmsma, Guenter; Rosenberg, Harry; Laabs, Johannes; and Becker, Kunibert, 3,925,995.

Labofina S. A.: *See*—
Cahen, Raymond M.; Debus, Henri R.; and Andre, Jacques M. J. G., 3,926,852.
De Hault, Emmanuel R. E. G. Draguez Tripels; Van Tongelen, Marcel; and Debus, Henri R., 3,927,039.

Laboratory Equipment Corporation: *See*—
Marshall, Richard A.; and Miller, Edward F., 3,926,043.

LaBorde, Joseph N., to Ethyl Corporation. Method of making a thermal break construction element. 3,925,953, Cl. 52-741.000.

Labossier, William H.; and Schilling, Hartmut, to Raytheon Company. Metallized isotropic boron nitride body. 3,926,571, Cl. 29-195.000.

LaBotz, Richard J., to United States of America, Air Force. Transpiration cooling washer assembly. 3,925,983, Cl. 60-265.000.

Ladany, Shaul P. Toy automobile. 3,925,925, Cl. 46-213.000.

Ladd, Floyd N.; and Stacy, Donald G., to Ford Motor Company. Vehicle window control system. 3,925,931, Cl. 49-227.000.

Ladd, Floyd N.; and Stacy, Donald G., to Ford Motor Company. Window regulator mechanism. 3,925,932, Cl. 49-227.000.

Ladd, Floyd N.; Raveschot, Marcel R.; and Stacy, Donald G., to Ford Motor Company. Power operated window regulator mechanism. 3,926,066, Cl. 74-435.000.

Ladouceur, Harold A.: *See*—
Pouch, Thomas M.; and Ladouceur, Harold A., 3,926,236.

Ladov, Edwin N., to Mobil Oil Corporation. Liquid lubricants containing crystalline sulfur and a sulfurized fat. 3,926,819, Cl. 252-31.000.

Laessig, Rudolf R., to General Electric Company. Vapor generator carburetion system. 3,926,150, Cl. 122-250.00R.

La Fata, John E.; and Cuccio, John D. Bubble gun toy. 3,925,923, Cl. 46-7.000.

Lailach, Gunter; and Rademachers, Jakob, to Bayer Aktiengesellschaft. Pretreatment of titanium-iron ores. 3,926,615, Cl. 75-3.000.

Lakso Company, Incorporated, The: *See*—
Saari, George W.; and Belliveau, Ronald L., 3,925,960.

Lala, Lekhu Kewalram: *See*—
Hall, John B.; Lala, Lekhu Kewalram; Beets, Muus G. J.; and Taylor, William I., 3,927,083.

Lallement, Georges Felix. Brackets. 3,926,395, Cl. 248-223.000.

Lamb, Kenneth; and Froud, Roderick Wilson, to International Time Recording Company Ltd. Record card systems. 3,927,302, Cl. 235-61.90R.

Lambertsen, Ejvind, to A/S E. Rasmussen. Insulated pipe systems with moisture detecting means. 3,927,351, Cl. 317-27.00R.

Lamm, Carl Goran: *See*—
Ruzicka, Jaromir; and Lamm, Carl Goran, 3,926,764.

Lamm, Heinz, to Daimler-Benz Aktiengesellschaft. Rotary piston internal combustion engine. 3,926,539, Cl. 418-149.000.

Lamparsky, Dietmar; and Calame, Jean-Pierre, to Givaudan Corporation. Substituted 2-[3'-methyl-2'-buten]yl-4-hexenal odorant compositions. 3,926,859, Cl. 252-522.000.

Lander, William M., to Index Packages, Inc. Tilt or inversion indicator. 3,926,144, Cl. 116-124.00R.

Landwehr, DeWayne A.; and Zeller, Gary P., to General Motors Corporation. Shock absorbing buffer assembly. 3,926,463, Cl. 293-63.000.

Landwehr, Dewayne A.: *See*—
Burns, Ronald N.; Landwehr, Dewayne A.; Schroeder, Roger H.; Vogelei, Robert A.; and Zeller, Gary P., 3,926,462.

Landy, Jerome J. Cabinet for biohazardous materials. 3,926,597, Cl. 55-338.000.

Lane, William P.: *See*—
Franklin, David M.; and Lane, William P., 3,927,367.

Lange, Jost; Schneider, Gerhart; and Zeh, Albert, to Hoechst Aktiengesellschaft. Foaming agent for plaster and cement compositions. 3,926,650, Cl. 106-90.000.

Langseth, Rollin Edward: *See*—
Cox, Donald Clyde; Langseth, Rollin Edward; Reudink, Douglas Otto John; and Rustako, Anthony Joseph, Jr., 3,927,379.

Lanoe, Bernard; and de Metz, Elisabeth. Electromagnetic radiation detector. 3,927,375, Cl. 325-363.000.

Lapporte, Seymour J.; and Toland, William g., to Chevron Research Company. Methylene and oxymethylene bis-ester production. 3,927,078, Cl. 260-494.000.

Larkin, John M.: *See*—
Duranleau, Roger G.; and Larkin, John M., 3,927,050.

Larsen, Hans R.: *See*—
Gaeckel, Bruno L.; and Larsen, Hans R., 3,927,145.

Laske, Louis Lawrence, to Vonco Products, Inc. Peel-seal containers. 3,926,311, Cl. 206-439.000.

Lasswell, Joseph A.; and Brown, Francis E., to Gulf Research & Development Company. Polyethylene powders. 3,926,934, Cl. 260-94.90A.

Laube, Dieter: *See*—
Kurth, Harald; Laube, Dieter; and Berthold, Erich, 3,926,013.

Lavarec, Martial: *See*—
Roche, Jean Claude; Lavarec, Martial; and Maurice, Jean, 3,926,073.

Lavigne, Vernon W.: *See*—
Bailey, James R.; and Lavigne, Vernon W., 3,926,499.

Lawrence Peska Associates, Inc.: *See*—
Colli, J. Louise, 3,925,915.
Martineau, Florianne, 3,925,912.
Nacci, Valentine, 3,926,435.

Lawson-Hemphill, Inc.: *See*—
Lawson, John B.; and Cooper, Charles S., 3,926,381.

Lawson, John B.; and Cooper, Charles S., to Lawson-Hemphill, Inc. Yarn tensioning means. 3,926,381, Cl. 242-47.010.

Laycock, John Nicholas Clayton: *See*—
Ray, Neil Hunter; Laycock, John Nicholas Clayton; and Robinson, William Derek, 3,926,649.

Leander, Leif, to Arenco KM-AB. Method of removing the hard and soft roe sacks, respectively, from fishes and apparatus for carrying out this method. 3,925,846, Cl. 17-60.000.

Leander, Leif; and Eriksson, Curt, to Arenco-KM AB. Method and apparatus for measuring and positioning of fish at head cutting. 3,925,847, Cl. 17-63.000.

Lear, Edward C.; and Fitton, Nigel S., to Singer Company, The. Yarn feed roller assembly. 3,926,132, Cl. 112-79.00A.

Lebailly, Jacques, to U.S. Philips Corporation. Monolithic semiconductor device including a protected electroluminescent diode. 3,927,344, Cl. 313-499.000.

Lebocey Industrie: *See*—
Palencher, Jacques, 3,926,225.

Le Can, Claude Jan Principe Frederic, to U.S. Philips Corporation. Storage device with row flag elements for row scanning. 3,927,396, Cl. 340-173.00R.

LeCorgne, William R., to Interpile USA, Inc. Method for forming cast-in-place caseless concrete piles. 3,925,998, Cl. 61-53.640.

Lee, Barry T.; Wimmer, Gunther W.; and Hyatt, Gilbert P. Adaptive illumination control device. 3,927,411, Cl. 354-4.000.

Lee, Cheuk Man, to Abbott Laboratories. Basic carbonates and carbamates of benzopyrans. 3,927,036, Cl. 260-345.300.

Lee, Henry Lawrence, II; Smith, Francis Fabian; and Swartz, Michael Lawrence, to Johnson & Johnson. Dental filling package. 3,926,906, Cl. 260-42.530.

Lee, Kun-Chieh: *See*—
Squires, Arthur M.; and Lee, Kun-Chieh, 3,926,593.

Lee, Sam S.: *See*—
Karayannis, Nicholas M.; Khelghatian, Missak; and Lee, Sam S., 3,926,928.

Lee, Sung Ki, to Andco Incorporated. Electrochemical removal of fluoride ion from aqueous media. 3,926,753, Cl. 204-149.000.

Lee, Sung Ki, to Andco Incorporated. Electrochemical contaminant removal from aqueous media. 3,926,754, Cl. 204-152.000.

Lee, Sydney: *See—*
Harvey, Kenneth; and Lee, Sydney, 3,927,202.

Leeds & Northrup Company: *See—*
MacMullan, Samuel Jay, 3,927,360.

Lefevre, Jean: *See—*
Gueussier, Andre; Tricot, Roland; and Lefevre, Jean, 3,926,685.

Legato, Gerard J.: *See—*
Micchelli, Albert L.; Legato, Gerard J.; Ganslaw, Stuart H.; and Schuler, Lawrence D., 3,927,199.

Legostaeva, Taisia Vasilievna: *See—*
Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovidh; Zakharova, Nina Vasilievna; Golubenko, Mikhail Afanasievich; Tolstikov, Genrikh Alexandrovich; Kholodovskaya, Rakhil Samoilovna; Shalimova, Zoya Stepanovna; Legostaeva, Taisia Vasilievna; Popov, Vasily Dmitrievich; and Dolidze, Vladimir Romanovich, 3,927,038.

Lehmann, Joachim: *See—*
Schmalfeld, Paul; Sauter, Dieter; Peters, Werner; Ahland, Erwin; Bock, Burkhard; and Lehmann, Joachim, 3,926,576.

Lehtinen, Timo Pellervo, to Oulo Osakeyhtio. Process for manufacturing valuable products from tall oil pitch. 3,926,936, Cl. 260-97.500.

Leifeld & Co.: *See—*
Schroder, Paul B.; and Pollkotter, Gunter, 3,926,025.

Leland Stanford Junior University, The Board of Trustees of the: *See—*
Marsden, Sullivan S., Jr.; and Hooker, Phillip R., 3,926,203.

Le Ludec, Joel, to Rhone-Poulenc S.A. Process for the preparation of hydroxylamines by hydrogenation of aromatic nitro derivatives. 3,927,101, Cl. 260-580.000.

Lemoing, Jean: *See—*
Poinsard, Henri; and Lemoing, Jean, 3,927,405.

Lemon, Stephen C.: *See—*
Madden, Michael J.; Murray, Robert L.; Lemon, Stephen C.; and Ostand, Paul R., 3,926,231.

Lennox Industries Inc.: *See—*
Parker, Sidney A.; and Rothstein, Seymour, 3,926,009.

Lenser Verwaltungs-GmbH: *See—*
Ramsteck, Wolfgang, 3,926,811.

Lenz, Arnold: *See—*
Ismail, Roshdy; Lenz, Arnold; and Termin, Erich, 3,927,151.

Lenz, George R., to G. D. Searle & Co. 6α-Carboxymethyl-17-hydroxy-3-oxo-17α-pregn-4-ene-21-carboxylic acid γ-lactone and intermediates thereto. 3,926,962, Cl. 260-239.570.

Lerner, Lewis Brian, to AMP Incorporated. Electrodeposition of gold-antimony alloys and compositions therefor. 3,926,748, Cl. 204-43.00G.

Le Roy, Pierre: *See—*
Bouchaudon, Jean; Le Roy, Pierre; and Messer, Mayer Naoum, 3,926,956.

Leroy, Vincent Marguerite: *See—*
Liesenborghs, Roland Cesar Amand; and Leroy, Vincent Marguerite, 3,926,688.

Leshner, Ervin; and Leshner, Michael D., to Fuel Injection Development Corporation. Combined fuel vapor injector and igniter system for internal combustion engines. 3,926,169, Cl. 123-32.0SJ.

Leshner, Michael D.: *See—*
Leshner, Ervin; and Leshner, Michael D., 3,926,169.

Leslie, Craig A., to Pierce Pacific Mfg. Inc. Carrier vehicle with pusher-type dolly. 3,926,453, Cl. 280-81.00R.

Lessman, Gerhard, to General Dynamics Corporation. Optical seeker scanning system. 3,927,254, Cl. 178-7.100.

LeSuer, William Monroe, to Lubrizol Corporation, The. Phosphorus, nitrogen and sulfo-containing additives. 3,926,821, Cl. 252-46.700.

Leva, Max. Entrainment separator in co-current flow. 3,926,592, Cl. 55-84.000.

Levene, Leon, to Owens-Illinois, Inc. Luminescent and/or photoconductive materials. 3,927,224, Cl. 427-64.000.

Lever Bros. Co.: *See—*
Venables, Susan Mary; and Watson, Charles Andrew, 3,925,957.

Lever Brothers Company: *See—*
Habasko, Werner; and Syrovatka, Rudolf, 3,926,841.
Ward, James Patrick, 3,925,903.

Levit, Alan D.: *See—*
Davis, Stephen A.; Dougherty, Keith H.; Levit, Alan D.; Hendrickson, Thomas A.; and Sanderson, Kenneth R., 3,926,088.

Lewicki, Lester R., to Bell Helmets Inc. Air cooled helmet. 3,925,821, Cl. 2-3.00R.

Lewis, Robert E.: *See—*
Winchell, Harry S.; and Lewis, Robert E., 3,926,176.

Lhoest, Willy, to Recherche et Industrie Therapeutiques. Bottles in semi-rigid plastic material. 3,926,341, Cl. 222-95.000.

Lhonore, Pierre: *See—*
Senes, Michel; Lhonore, Pierre; Pottier, Michel; and Quibel, Jacques, 3,926,853.

Li, George S.; and Coffey, Gerald P., to Standard Oil Company, The. Thermoplastic acrylonitrile copolymers. 3,926,926, Cl. 260-85.50B.

Li, George S.: *See—*
Hensley, Linda W.; and Li, George S., 3,926,871.

Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovidh; Zakharova, Nina Vasilievna; Golubenko, Mikhail Afanasievich; Tolstikov, Genrikh Alexandrovich; Kholodovskaya, Rakhil Samoilovna; Shalimova, Zoya Stepanovna; Legostaeva, Taisia Vasilievna; Popov, Vasily Dmitrievich; and Dolidze, Vladimir Romanovich. Method of producing isomers of methyltetrahydrophthalic anhydride. 3,927,038, Cl. 260-346.300.

Libbey-Owens-Ford Company: *See—*
Miller, Alfred H.; and Wheat, Lawrence C., 3,926,298.

Libbey, William J., to Continental Oil Company. Method of producing alkyltrifluorosilane compounds. 3,927,058, Cl. 260-448.20E.

Libbey, William J.; and Lundeen, Allan J., to Continental Oil Company. Method of producing dialkyldifluorosilane compounds. 3,927,059, Cl. 260-448.20E.

Libbey, William J., to Continental Oil Company. Method of producing diethyldifluorosilane. 3,927,060, Cl. 260-448.20E.

Licata, Joseph; Bartley, George S.; and Longenderfer, John E., to Lutron Electronics Co., Inc. Fluorescent dimming circuit with D-C flicker elimination. 3,927,345, Cl. 315-.5G..

Lieb, Donald F.; and Stillman, Neil W., to Diamond Shamrock Corporation. Apparatus for electrosanitizing waste water. 3,926,771, Cl. 204-268.000.

Liebscher, Harald: *See—*
Knopf, Werner; and Liebscher, Harald, 3,925,962.

Liechti, Peter, to Ciba-Geigy AG. New oxazole compounds, process for their manufacture, and their use as optical brighteners for organic materials. 3,926,964, Cl. 260-240.0CA.

Liedholz, Gerhard A., to Coulter Electronics, Inc. Blank value storing photometer circuitry. 3,927,317, Cl. 250-214.00R.

Liesenborghs, Roland Cesar Amand; and Leroy, Vincent Marguerite, to Societe Anonyme Cockerill-Ougree-Providence et Esperance-Longdoz. Method of manufacturing a flat steel product having an oxidation-resistant coating. 3,926,688, Cl. 148-12.100.

Lilly Industries Limited: *See—*
Messora, Edoardo, 3,927,195.

Lin, Tsung-Min, to Eli Lilly and Company. Method for alleviating gastric mucosal bleeding. 3,927,212, Cl. 424-177.000.

Lindahl, Charles B.: *See—*
Jones, John L.; Rubino, Andrew M.; and Lindahl, Charles B., 3,927,188.

Lindblad, Oskar Lennart. Safety belt arrangement for individuals. 3,926,455, Cl. 280-150.0SB.

Linde Aktiengesellschaft: *See—*
Wildmoser, Alfred; and Dannhorn, Erich, 3,926,591.

Lindenfors, Sven Georg; and Westberg, Sven-Olof Johan, to MoDoKemi AB. Nonionic cellulose ethers. 3,926,951, Cl. 260-231.00A.

Lindner, Heinz-Joachim, to Siemens Aktiengesellschaft. Impregnating compound for fiber glass mats. 3,927,234, Cl. 428-273.000.

Lingens, Paul: *See—*
Klunsch, Maximilian; Lingens, Paul; and Ratz, Heinz, 3,926,696.

Linton, Thomas Harry. Herbicide roller for weed control. 3,925,927, Cl. 47-1.500.

Lipani, Anthony F., to Xerox Corporation. Electrostatographic developer composition. 3,926,824, Cl. 252-62.100.

Lipp, Ellis P., to P. R. Mallory & Co. Inc. Switch assembly with limit stop structure allowing alternate make and break operational switch states. 3,927,276, Cl. 200-327.000.

Lippiatt, Raymond: *See—*
Croft, Robert; and Lippiatt, Raymond, 3,927,158.

Lippitsch, Hans Heinz, to Bombardier Limited. Two-cycle engine with inlet porting by rotary valve. 3,926,157, Cl. 123-73.00D.

Lippman, Michael David: *See—*
White, Hugh Edward; and Lippman, Michael David, 3,927,251.

Lippmann, Wilbur, to American Home Products Corporation. Prostaglandin E_2 and derivatives for reducing the side effects of anti-inflammatory agents. 3,927,213, Cl. 424-234.000.

Lipska, Anne E., to Stanford Research Institute. Controlled pyrolysis of cellulosic materials for production of chemicals. 3,926,947, Cl. 260-209.00R.

Lithium Corporation of America: *See—*
Hoffman, Doyt K.; and Bach, Ricardo O., 3,926,833.

Litschi, Gerold: *See—*
Guenst, William C., Jr.; and Litschi, Gerold, 3,926,297.

Litton Industrial Products, Inc.: *See—*
Vandervelden, Cornelius Keith, 3,926,370.

Liu, Robert Chung-Huang: *See—*
Hughes, John Lawrence; Seyler, Jay Kenneth; and Liu, Robert Chung-Huang, 3,926,938.

Ljungberg, John Erik, to Facit Aktiebolag. Dual carriage impact printer with belt drive. 3,926,293, Cl. 197-1.00R.

Llewellyn, Richard E.: *See—*
D'Anna, Ronald F.; and Llewellyn, Richard E., 3,927,310.

Lochner, Herbert, to Cikalon-Vliesstoffwerk GmbH. Method and needle machine for the production of pile fabrics. 3,925,866, Cl. 28-4.00R.

Locke, Edward V.; and Hella, Richard A., to Avco Everett Research Laboratory, Inc. Mirror for high power lasers. 3,926,510, Cl. 350-310.000.

LogEtronics Inc.: *See—*
Kinoshita, Minoru; and Taniuchi, Osami, 3,927,417.

Lohmann, Dieter: *See—*
Greber, Gerd; Darms, Roland; and Lohmann, Dieter, 3,926,911.

Lombardino, Joseph G., to Pfizer Inc. N-(pyridyl)-N'-alkyl-N'-(2-alkoxycarbonylbenzenesulfonyl)-glycineamides and derivatives. 3,927,002, Cl. 260-294.80F.

Long, Cecil L.: *See—*
Sisco, Willie J., Jr.; Long, Cecil L.; and Kifer, James M., 3,926,652.

Long, Roger A., to Teledyne Ryan Aeronautical a Division of Teledyne Industries, Inc. Method of manufacturing high strength fiber reinforced thermo plastic parts. 3,926,708, Cl. 156-242.000.

Longenderfer, John E.: *See—*
Licata, Joseph; Bartley, George S.; and Longenderfer, John E., 3,927,345.

Lonza Ltd., Gampel/Valais: *See—*
Bertsch, Erich, 3,926,741.

Looker, Brian Edgar: *See—*
Barton, Derek Harold Richard; Underwood, William George Elphinstone; Looker, Brian Edgar; and Hewitt, Graham, 3,927,013.

Loretto, John C.; and Hanney, Kenneth E. N. Direct recovery of metals from sulphide ores by leaching and electrolysis. 3,926,752, Cl. 204-107.000.

Losenno, Luigi G. Protection apparatus. 3,926,200, Cl. 132-9.000.

Louvet, Olivier F.: *See—*
Voyer, Paul; Pitie, Jean-Marc B.; Louvet, Olivier F.; and Roche, Alain Y., 3,927,267.

Love, Richard F.: *See—*
Duranleau, Roger George; and Love, Richard F., 3,927,048.

Lovich, John W.; Meller, Oscar W.; and Sprick, Walter F., to Goodyear Aerospace Corporation. Cargo container latches. 3,926,243, Cl. 160-328.000.

Lovisa, Peter R.; and Tausanovitch, Dusan, to Lovisa, Peter R.; Tausanovitch, Dausan; and Lovisa, Tullio, part interest to each. Tie rod for use with an internal spreader means. 3,926,404, Cl. 249-213.000.

Lovisa, Tullio: *See—*
Lovisa, Peter R.; and Tausanovitch, Dusan, 3,926,404.

Low, Jack B.; Crist, Buckley; and Zoltner, Thomas J., to Jaclo, Inc. Flowable material dispenser with resilient container. 3,926,347, Cl. 222-185.000.

Lowe, Gordon, to National Research Development Corporation. 7-Hydrazono and hydrazino cephalosporins. 3,926,972, Cl. 260-243.00C.

Lowe, Kenneth, to Simon-Carves Limited. Doors. 3,926,242, Cl. 160-89.000.

Lowe, William F.; and Bondy, Harry L., to E-Z Machine Corporation. Apparatus for producing and assembling tabbed cards. 3,926,713, Cl. 156-510.000.

Lubrizol Corporation, The: *See—*
Habiby, Emile Najib, 3,926,822.
LeSuer, William Monroe, 3,926,821.

Lucas Electrical Company Limited, The: *See—*
Bowcott, Roy Price, 3,925,881.
Hill, William Frank, 3,927,390.
Wentworth, Philip Rossell; and Bertioli, Michael Murray, 3,927,304.
Williams, Malcolm, 3,926,154.

Lucero, Daniel P., to Meloy Laboratories, Inc. Gas analysis employing semi-permeable membrane. 3,926,561, Cl. 23-232.00R.

Lucey, George K., Jr.: *See—*
Williams, David; and Lucey, George K., Jr., 3,926,120.

Luck, Erich: *See—*
Clauss, Karl; Jensen, Harald; and Luck, Erich, 3,926,976.

Ludvigsson, Birger. Device for excluding water from a working site located adjacent to a body of water. 3,926,002, Cl. 61-64.000.

Ludwigson, David C., to United States Steel Corporation. Drawability of deoxidized steels by the addition of phosphorus and silicon. 3,926,692, Cl. 148-36.000.

Luethi, Christian, to Ciba-Geigy AG. Bis-stilbene compounds. 3,927,119, Cl. 260-613.00A.

Luhleich, Hartmut; Nickel, Hubertus; and Dias, Francesco, to Kernforschungsanlage JULICH GmbH. Method of making shaped carbonaceous bodies. 3,927,187, Cl. 423-448.000.

Lukowski, Heinz, to Feldmuhle Anlagen- und Produktions- gesellschaft mit beschrankter Haftung. Abrasive sheet containing a grain-size binder with wax particles. 3,926,585, Cl. 51-295.000.

Lundebrek, Kenneth A. Draw pin safety lock device. 3,926,456, Cl. 280-515.000.

Lundeen, Allan J.: *See—*
Libbey, William J.; and Lundeen, Allan J., 3,927,059.

Lussling, Theodor; Schaefer, Hans; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Catalyst for the production of aromatic hetero-aromatic nitriles and process of preparing the catalyst. 3,926,856, Cl. 252-470.000.

Lussling, Theodor; Schaefer, Hans; and Weigert, Wolfgang, to Deutsche God- und Silber-Scheideanstalt vormals Roessler. Catalysts for the production of aromatic and heteroaromatic nitriles. 3,927,007, Cl. 260-294.900.

Lustig, Heinz: *See—*
Wunning, Joachim; Bieber, Rolf; and Lustig, Heinz, 3,926,038.

Lutron Electronics Co., Inc.: *See—*
Licata, Joseph; Bartley, George S.; and Longenderfer, John E., 3,927,345.

Luttrell, Argil W. Mobile sit-on toy crane. 3,926,316, Cl. 212-59.00R.

Lutzker, Robert S. Pouring fitment with filter. 3,926,348, Cl. 222-189.000.

Lysell, Gunnar, to Aktiebolaget Atomenergi. Method of operating a water-cooled nuclear reactor. 3,926,721, Cl. 176-19.00R.

Lytton, Kenneth G., to Fibers Controls Corporation. Density sensing and controlling equipment. 3,925,850, Cl. 19-98.000.

M.A.J.: *See—*
Orliaguet, Maurice, 3,925,961.

M&T Chemicals Inc.: *See—*
Fourier, Walter A.; and Dickmann, Daniel J., 3,926,879.
Passal, Frank, 3,926,749.
Touval, Irving, 3,926,883.

MacDonald, William E.; and Harris, Robert C., Jr., to Interpace Corporation. Method of decorating a surface of an article. 3,927,230, Cl. 427-282.000.

Machacek, Oldrich: *See—*
Hurst, Gerald L.; and Machacek, Oldrich, 3,926,119.

Macharg, James Adrian. Battery chargers. 3,927,361, Cl. 320-39.000.

Machat, Jean-Yves; and Sohm, Jean-Claude, to Anvar, Agence National de Vaolirsation de la Recherche. Electric primary cells. 3,926,677, Cl. 136-107.000.

Mack Trucks, Inc.: *See—*
Kronstadt, Victor, 3,926,075.

MacLarty, Bernard Graham, to Phoenix Valve Manufacturers Limited. Fluid flow control valve. 3,926,211, Cl. 137-494.000.

Macleod, Norman, to National Research Development Corporation. Fluid control valves. 3,926,215, Cl. 137-527.800.

MacMullan, Samuel Jay, to Leeds & Northrup Company. Null-balance servo system. 3,927,360, Cl. 318-619.000.

Macovski, Albert. Cross-sectional fluorescent imaging system. 3,927,318, Cl. 250-272.000.

Madden, Michael J.; Murray, Robert L.; Lemon, Stephen C.; and Ostand, Paul R., to Dover Corporation. System for loading liquid into a container or the like. 3,926,231, Cl. 141-192.000.

Madden, Robert J.: *See—*
Evankovich, Peter P.; Madden, Robert J.; and Peterson, Edward M., 3,926,241.

Mader, Helmut: *See—*
Saleck, Wilhelm; Engelhard, Helmut; Himmelmann, Wolfgang; Bentz, Francis; and Mader, Helmut, 3,926,635.

Madigan, David C.: *See—*
Dixon, Percy; and Madigan, David C., 3,927,170.

Maeda, Haruo, to Olympus Optical Company Limited. Retrofocus type wide angle lens system. 3,926,506, Cl. 350-214.000.

Maeda, Yoshihiro: *See—*
Tsuchida, Takashi; Shinoda, Kenichi; Yamamoto, Kohei; Murata, Tomoya; and Maeda, Yoshihiro, 3,926,678.

Maeder, Arthur: *See—*
Huber-Emden, Helmut; Eschle, Karl; and Maeder, Arthur, 3,927,091.

Maezawa, Shuji, to Kabushiki Kaisha Suwa Seikosha. Display system for showing the days of the week in an electrical timepiece. 3,925,977, Cl. 58-4.00A.

Magerlein, Helmut: *See—*
Zengel, Hans-Georg; Toth, Anton; Magerlein, Helmut; and Meyer, Gerhard, 3,927,085.

Magna Machine & Tool Co.: *See—*
Brooks, Wayne D.; and Hendricks, Thomas L., 3,926,032.

Magnetic Controls Company: *See—*
Deitch, James C.; and Robert, Lawrence A., 3,927,275.

Maguire, Gerald J.: *See—*
Berry, Peter J.; and Maguire, Gerald J., 3,926,518.

Mahall, Karl: *See—*
Rall, Ulrich; Mahall, Karl; and Kuper, Wilfried, 3,927,229.

Mahrer, Francois-Regis, to Kugler Fonderie et Robinetterie S.A. Mixer for hot and cold liquids. 3,926,220, Cl. 137-636.100.

Maillaro, Felix, to Narducci, Michael C. Safety electrical male plug having normally recessed manually extendable contacts. 3,926,494, Cl. 339-34.000.

Makino, Shigeru: *See—*
Katori, Tatsuhiko; Sato, Giichi; Kihara, Takashi; Yumoto, Norio; Makino, Shigeru; and Harada, Juntaro, 3,927,082.

Makowski, Henry S.; and Buckley, Donald J., Sr., to Exxon Research & Engineering Co. Thermoplastic block copolymers. 3,927,143, Cl. 260-886.000.

Malaszkiewicz, Jurgen: *See—*
Wendler, Ingrid; and Malaszkiewicz, Jurgen, 3,926,840.

Mallinckrodt, Inc.: *See—*
Monte, Alexander A.; and Chiang, Ching, 3,926,735.

Mangeli, John Kilolo, to Colgate-Palmolive Company. Method for making detergent compositions. 3,926,827, Cl. 252-99.000.

Mangels, John Anthony, to Ford Motor Company. Improved flow-molding composition. 3,926,656, Cl. 106-272.000.

Manning, Robert E.: *See—*
Houlihan, William J.; and Manning, Robert E., 3,927,096.

Marans, Nelson S.; and Gluecksman, Alfred, to W. R. Grace & Co. Radiation polymerizable polyester composition. 3,926,755, Cl. 204-159.150.

Marchaj, Tadeusz Josef: *See—*
Closner, John J.; Marchaj, Tadeusz Josef; and Wichman, Sven Hjalmar, 3,926,134.

Marchessault, Robert H.; and Fisa, Bohuslav, to Canada, Her Majesty, The Queen, in Right of, as represented by the Minister of Nat. Defence. Process for forming a polymeric film inside a cellulosic matrix and product obtained therefrom. 3,926,717, Cl. 162-157.00C.

Marcoux, Emery. Sandal. 3,925,914, Cl. 36-11.500.

Marcus, Konrad H., to Prince Corporation. Visor assembly. 3,926,470, Cl. 296-97.00B.

Mares, Trinidad; and Arthur, Jett Clinton, to United States of America, Agriculture. Cellulose terpolymer textiles. 3,926,549, Cl. 8-116.00R.

Margulies, Leon; Mazur, Yehuda; Sagiv, Jacob; and Yogev, Amnon, to Yeda Research and Development Co., Ltd. Method of and means for obtaining a pair of orthogonal linear dichroic parameters. 3,926,524, Cl. 356-114.000.

Marincic, Nikola: *See—*
Curelop, Edward J.; and Marincic, Nikola, 3,926,672.

Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 3,926,908, Cl. 260-45.70S.

Markewitz, Wolfgang; and Bolduan, Dieter, to Messrs. Huennebeck GmbH. Collapsible care means for forming a three sided enclosure with a roof. 3,926,403, Cl. 249-185.000.

Marrast, Jacques; Minssieux, Louis; and Blondin, Eric, to Gaz de France; and Institut Francais du Petrole. Well cementing processes. 3,926,257, Cl. 166-293.000.

Marsden, Sullivan S., Jr.; and Hooker, Phillip R., to Leland Stanford Junior University, The Board of Trustees of the. Method of transporting crude oil at low temperatures by dispersion in methanol. 3,926,203, Cl. 137-13.000.

Marshall, Edward W.: *See—*
Kase, Heino; Marshall, Edward W.; and Kirtikar, Survrat, 3,927,409.

Marshall, Richard A.; and Miller, Edward F., to Laboratory Equipment Corporation. Road simulator system with provision for engine degradation compensation. 3,926,043, Cl. 73-117.000.

Martin Marietta Corporation: *See—*
Mueller, Heinz E., 3,925,982.

Martin, Michael Ray: *See—*
McKeon, Edward Francis Thomas; and Martin, Michael Ray, 3,927,332.

Martineau, Florianne, to Lawrence Peska Associates, Inc., a part interest. Ventilated boot. 3,925,912, Cl. 36-3.00R.

Marty, Claude: *See—*
Ribeyre, Jean-Paul; and Marty, Claude, 3,926,252.

Marvin Glass & Associates: *See—*
Breslow, Jeffrey D.; and Kaelin, Bette M., 3,926,438.
Schoenfield, Palmer J., 3,925,924.

Marx, Matthias: *See—*
Barzynski, Helmut; Marx, Matthias; Storck, Gerhard; and Saenger, Dietrich, 3,926,636.

Maryland Patent Development Co., Inc.: *See—*
Shubert, Roland H., 3,926,789.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Schurrer, Josef; and Meyer, Josef, 3,926,053.

Mason, David Robert: *See—*
Cole, Susan Margaret; Mason, David Robert; and Rothon, Roger Norman, 3,926,658.

Massachusetts Institute of Technology: *See—*
Green, Howard; and Rheinwald, James G., 3,926,723.
Pratt, George W., Jr., 3,927,385.

Master Pneumatic-Detroit, Inc.: *See—*
Thrasher, George E., 3,926,279.

Mastrangelo, Sebastian Vito Rocco, to Du Pont de Nemours, E. I., and Company. Dielectric composition capable of electrical activation. 3,926,916, Cl. 252-63.500.

Mata, Justo Martinez: *See—*
Stapley, Edward O.; and Mata, Justo Martinez, 3,927,210.

Mathues, Thomas P., to General Motors Corporation. Dual master cylinder including a plurality of proportioning valves located within pressurizing pistons. 3,926,476, Cl. 303-6.00C.

Matkin, Derek Ivan; Cavell, Ian William; and Dyson, John Raymond, to United Kingdom Atomic Energy Authority. Electrically conducting material containing silicon carbide in a matrix of silicon nitride. 3,926,857, Cl. 252-516.000.

Matrisian, Robert Michael, to c/o E. I. Du Pont de Nemours & Co. Process for applying contacts. 3,926,357, Cl. 228-110.000.

Matsubara, Masaki, to Olympus Optical Company Limited. Objective lens systems for use in microscopes. 3,925,910, Cl. 350-218.000.

Matsuda, Mitsuhiro: *See—*
Tsugukuni, Hideyoshi; Kano, Masafumi; and Matsuda, Mitsuhiro, 3,926,875.

Matsuda, Yoshio, to Yoshida Kogyo Kabushiki Kaisha. Warp knitted tape for slide fasteners. 3,926,017, Cl. 66-195.000.

Matsumoto, Koichi: *See—*
Aishima, Itsuho; Kitaoka, Atsushi; Koseki, Toshinori; Suzuki, Sachio; Arimoto, Kenji; and Matsumoto, Koichi, 3,926,873.

Matsumura, Hideki: *See—*
Kadowaki, Takashi; Iwasaki, Takao; and Matsumura, Hideki, 3,927,130.

Matsushita Electric Industrial Co., Ltd.: *See—*
Kawabata, Hidetsugu; and Yamashita, Tadaoki, 3,927,328.
Nada, Naohiro; and Yamashita, Tadaoki, 3,926,836.

Mattiello, Giuseppe: *See—*
Perla, Giulio; and Mattiello, Giuseppe, 3,926,863.

Matts, Sigvard, to Aktiebolaget Svenska Flaktfabriken. Method and apparatus for cooling a gas with water droplets. 3,926,586, Cl. 55-10.000.

Mattucci, Neil: *See—*
Baron, Richard C.; Cerankowski, Leon D.; and Mattucci, Neil, 3,926,922.

Matuschke, Walter E. S. Rotary lithographic printing press with ink and dampening fluid separator. 3,926,114, Cl. 101-142.000.

Mauceri, Albert; and Mirarchi, Carl. Wallboard fastener. 3,926,394, Cl. 248-217.000.

Maunsell & Partners Pty. Limited: *See—*
Andrew, Paul Hugh Finden; and Moxham, Kenneth Ewing, 3,925,999.

Maurice, Jean: *See—*
Roche, Jean Claude; Lavarec, Martial; and Maurice, Jean, 3,926,073.

Max Muller Brinker Maschinenfabrik Zweigniederlassung der Gildemeister Aktiengesellschaft: *See—*
Junike, Wilhelm August Karl; and Koch, Hans-Joachim, 3,925,877.

May, Walter R.: *See—*
Zetlmeisl, Michael J.; May, Walter R.; and Annand, Robert R., 3,926,577.

Mayer-Mader, Rudolf; and Gobel, Wilhelm, to Bayer Aktiengesellschaft. Polymerizing chloroprene in the presence of xanthogen disulphides with functional groups. 3,926,912, Cl. 260-92.300.

Mayfield, Leonard E. Floating idler pulley apparatus. 3,926,063, Cl. 74-242.11A.

Maytronics, Inc.: *See—*
Thompson, Marion E., 3,927,402.

Mazeika, Albert J., to Eugene H. Clement, Hi-Gene Laundry Co. Locking system. 3,926,019, Cl. 70-85.000.

Mazur, Yehuda: *See—*
Margulies, Leon; Mazur, Yehuda; Sagiv, Jacob; and Yogev, Amnon, 3,926,524.

McCaffray, Edmund, Jr. Machine and method for manufacturing brooms from plastic fibers. 3,926,475, Cl. 300-21.000.

McCall, John W., to Formall, Inc. Conveyor trolley clevis hanger safety attachment device. 3,926,303, Cl. 198-177.00R.

McCall, Richard H., to Texaco Inc. Methods and apparatuses for controlling and preventing blow-outs in wells. 3,926,256, Cl. 166-285.000.

McCaully, Ronald J., to American Home Products Corporation. 1,4-Benzodiazepin-2-ones and their synthesis. 3,926,952, Cl. 260-239.30D.

McCaully, Ronald J.: *See—*
Nudelman, Abraham; and McCaully, Ronald J., 3,926,974.

McChesney, James D.: *See—*
Fox, J. Eugene; and McChesney, James D., 3,926,949.

McClory, Robert M., to Aqua-Chem, Inc. Readily attachable water filter with cutoff valve. 3,926,815, Cl. 210-424.000.

McClure, Charles Laird, to Pro-Tech Inc. Fluid filtration and sampling. 3,926,804, Cl. 210-76.000.

McColgan, John M. ABS Resin compounds. 3,926,884, Cl. 260-28.5AS.

McCombs, Howard L., to Bendix Corporation, The. Control apparatus particularly for a plurality of compressor bleed valves of gas turbine engine. 3,925,980, Cl. 60-39.290.

McConnell, Lorne D., to ITE Imperial Corporation. Self-switched inductive fault current limiter. 3,927,350, Cl. 317-11.00C.

McConnell, Vince. Water ski rope holder. 3,926,383, Cl. 242-85.100.

McConnell, William G. Paper tube adhesive and paper tube. 3,926,657, Cl. 106-286.000.

McCormick, Eugene C. Engine dampener means. 3,926,156, Cl. 123-41.690.

McCormick, James B. System for measuring growth and health characteristics. 3,925,901, Cl. 33-137.00R.

McCoy, Frederic C.; and Cole, Edward L., to Texaco, Inc. Hydrocarbon solution containing a surfactant and an alkyl phenol used in an alkylation process. 3,926,839, Cl. 252-355.000.

McCracken, Robert H., to United States of America, Army. Time remaining until encounter computer for a fuze system. 3,926,121, Cl. 102-70.20P.

McCrosky Tool Corporation: *See—*
Singh, Kanwar J., 3,925,868.

McDaniel, Lloyd B. Timing cover replacement tool. 3,925,872, Cl. 29-267.000.

McDonnell Douglas Corporation: *See—*
Steube, Kenneth E., 3,926,147.

McDowell, James A. Method and apparatus for encoding dental work. 3,925,896, Cl. 32-40.00R.

McFadden, James D. Alignment clamp. 3,925,854, Cl. 24-81.0PE.

McFadden, Russell T.: *See—*
Gross, James R.; and McFadden, Russell T., 3,926,891.

McFarland, James W., to Pfizer Inc. Aldol products of 2-quinoxalinecarboxaldehy-1,4-dioxides. 3,926,992, Cl. 260-250.0QN.

McInnes, Robert, to Bowman, Harry P.; Millhouse, Clifford J.; and Bowers, Russell E., part interest to each. Method and apparatus for cleaning and plating articles within a plurality of rotating barrels. 3,926,666, Cl. 134-25.00R.

McIntosh, Duane E., to General Motors Corporation. Method and apparatus for coding and decoding digital data. 3,927,401, Cl. 340-347.0DD.

McIrvine, John Douglas: *See—*
Archambault, Jacques Olivier; and McIrvine, John Douglas, 3,927,191.

McKeon, Edward Francis Thomas; and Martin, Michael Ray, to RCA Corporation. Drive circuit for controlling conduction of a semiconductor device. 3,927,332, Cl. 307-252.00C.

McLean, Donald C.: *See—*
Gilbert, Eugene C.; Jones, Robert E.; McLean, Donald C.; and Sherman, Edward, 3,927,106.

McLean, Robert E., to Rival Manufacturing Company. Can opener with removable hand lever and pivotal latch. 3,925,887, Cl. 30-4.00R.

McLeod, Donald A. Log skidding cone. 3,926,410, Cl. 254-1.000.

Mead Corporation, The: *See—*
Robinson, James V., 3,927,111.

Meadow, Morton; and Berkowitz, Sidney, to FMC Corporation. Process for producing carbon disulfide. 3,927,185, Cl. 423-443.000.
Mecca, Sebastian B., to Schuylkill Chemical Company. Allantoin glycine complex. 3,927,021, Cl. 260-309.500.
Mechaneer, Inc.: *See*—
Shively, Lawrence A.; and Hoy, Robert P., 3,926,320.
Mecum, Robert C. Bicycle frame alignment apparatus. 3,925,873, Cl. 29-271.000.
Mederer, Andreas, to Messerschmitt-Bolkow-Blohm GmbH. Aircraft of a controllable stability. 3,926,389, Cl. 244-45.00A.
Meditrac: *See*—
Stabholz, Ludvig M., 3,926,182.
Medley, Ronald D., to Cosden Oil & Chemical Company. Formal profile extrusion process. 3,927,160, Cl. 264-45.500.
Medrano, Alfred M., to United States of America, Navy. Divers navigation display. 3,927,388, Cl. 340-6.00R.
Medtronic, Inc.: *See*—
Mulier, Pieter M. J.; Jirak, Thomas L.; and Kane, Lawrence M., 3,927,366.
Medvinsky, Moisei Davidovich: *See*—
Zhukov, Oleg Nikolaevich; Medvinsky, Moisei Davidovich; and Ryk, Vladimir Izidorovich, 3,926,039.
Meguro, Kanji: *See*—
Kuwada, Yutaka; Meguro, Kanji; and Tawada, Hiroyuki, 3,927,015.
Mehltretter, Charles L.: *See*—
Otey, Felix H.; Westhoff, Richard P.; and Mehltretter, Charles L., 3,926,868.
Meier, Johann, to Precisa AG Rechenmaschinenfabrik. Force measuring device. 3,926,270, Cl. 177-251.000.
Meier, Walter; Zeller, Josef; Koenig, Peter J.; Bruderer, Werner; and Schmid, Markus, to Concast AG. Method of controlling the cooling rate of narrow side walls of plate molds as a function of the casting taper during continuous casting. 3,926,244, Cl. 164-4.000.
Meier, Werner: *See*—
Furst, Andor; Buchschacher, Paul; Kagi, Dieter; Meier, Werner; Muller, Marcel; and Widmer, Erich, 3,927,032.
Grochol, Jan; and Meier, Werner, 3,927,165.
Meiji Seika Company Ltd.: *See*—
Tsuruoka, Takashi; Niwa, Tomizo; Shibata, Uichi; Inouye, Shigeharu; and Niida, Taro, 3,927,001.
Meiji Seika Kaisha, Ltd.: *See*—
Kondo, Shinichi; Sezaki, Masaji; Koike, Makiko; Shimura, Masaru; Akita, Eiichi; Satoh, Kimio; Hamamoto, Kazuko; Niida, Taro; and Hara, Takeshi, 3,926,948.
Meller, Oscar W.: *See*—
Lovich, John W.; Meller, Oscar W.; and Sprick, Walter F., 3,926,243.
Melnik, George. Ruler-beam. 3,925,898, Cl. 33-27.00C.
Meloy Laboratories, Inc.: *See*—
Lucero, Daniel P., 3,926,561.
Melzer, Stephen F., to Armco Steel Corporation. Treatment of acid waste waters to produce ferromagnetic sludges. 3,927,173, Cl. 423-142.000.
Menzl, Roland L., to Standard Oil Company. Process for producing a colorless mineral oil having good hazing properties. 3,926,777, Cl. 208-57.000.
Merck & Co., Inc.: *See*—
Bolhofer, William A., 3,927,092.
Girotra, Narindar N.; and Wendler, Norman L., 3,926,965.
Rogers, Edward F.; Dybas, Richard A.; and Hannah, John, 3,926,935.
Stapley, Edward O.; and Mata, Justo Martinez, 3,927,210.
Merck Patent Gesellschaft mit beschraenkter Haftung: *See*—
Bernhard, Horst; Esselborn, Reiner; Hesse, Reiner; and Russmann, Horst, 3,926,659.
Poetsch, Eike, 3,926,999.
Merker, George; Krupp, Joseph; Ricards, Charles R.; and Ward, Thomas A., to American Newspaper Publishers Association. High speed in-line paper inserting apparatus and method. 3,926,423, Cl. 270-55.000.
Merrick, James Walter, to Autotronic Controls Corporation. Multiple spark discharge system. 3,926,165, Cl. 123-148.00E.
Merrill Manufacturing Company, Inc.: *See*—
Anderson, Noel M.; and Otto, Arlin W., 3,926,206.
Anderson, Noel M.; and Otto, Arlin W., 3,926,207.
Mersereau, Emory P.: *See*—
Trifunovic, Alexander L.; Hills, William H.; Borgman, Milton H.; and Mersereau, Emory P., 3,925,976.
Mertdogan, Akgun: *See*—
Keyser, Naaman H.; and Mertdogan, Akgun, 3,926,623.
Merz, Jurg: *See*—
Schibler, Luzius; and Merz, Jurg, 3,927,089.
Messer, Mayer Naoum: *See*—
Bouchaudon, Jean; Le Roy, Pierre; and Messer, Mayer Naoum, 3,926,956.
Messerschmitt-Bolkow-Blohm GmbH: *See*—
Mederer, Andreas, 3,926,389.
Messner, Daryle: *See*—
Genest, Leonard J.; Feagin, Frederick E.; Cole, Sylvan; and Messner, Daryle, 3,926,021.
Messora, Edoardo, to Lilly Industries Limited. Production of capsules. 3,927,195, Cl. 424-21.000.
Messrs. Huennebeck GmbH: *See*—
Markewitz, Wolfgang; and Bolduan, Dieter, 3,926,403.
Metallgesellschaft Aktiengesellschaft: *See*—
Schmalfeld, Paul; Sauter, Dieter; Peters, Werner; Ahland, Erwin; Bock, Burkhard; and Lehmann, Joachim, 3,926,576.
Meyer, Arnfried. Apparatus for the continuous wrinkling of web shaped flat materials. 3,925,863, Cl. 26-1.000.
Meyer, Artur; Gotsmann, Ulrich; and Meyer, Ernst, to Cassella Farbwerke Mainkur AG. Yellow sulfur dyestuff and preparation thereof. 3,927,012, Cl. 260-304.000.
Meyer, Ernst: *See*—
Meyer, Artur; Gotsmann, Ulrich; and Meyer, Ernst, 3,927,012.
Meyer, Gerhard: *See*—
Zengel, Hans-Georg; Toth, Anton; Magerlein, Helmut; and Meyer, Gerhard, 3,927,085.
Meyer, Hans Rudolf, to Ciba-Geigy AG. New benzoxazolylstilbenes as optical brighteners. 3,926,963, Cl. 260-240.0CA.
Meyer, Josef: *See*—
Schurrer, Josef; and Meyer, Josef, 3,926,053.
Meyer-Stoll, Hans-Albrecht; Wollner, Johannes; and Schittek, Hans-Heinz, to Deutsche Texaco Aktiengesellschaft. Methylolated 5,5-dialkylhydantoin film forming synthetic resin as a hair fixative. 3,927,198, Cl. 424-47.000.
Meyers, Michael: *See*—
Moe, Walter; and Meyers, Michael, 3,926,437.
Meyers, Robert A., to TRW Inc. Removal of pyritic sulfur from coal. 3,926,575, Cl. 44-1.00R.
Meyers, Robert E., to Bendix Corporation, The. Concentric hydraulic brake boost mechanism with system by-pass on piston o.d. 3,926,092, Cl. 91-378.000.
Meyers, Robert M.; Kutch, Edward F.; and Sitter, Matthew M., to Novagard Corporation. Automobile window sealing. 3,925,947, Cl. 52-208.000.
Micchelli, Albert L.; Legato, Gerard J.; Ganslaw, Stuart H.; and Schuler, Lawrence D., to National Starch and Chemical Corporation. Hair fixing compositions containing N-alkyl acrylamide or methacrylamide interpolymer. 3,927,199, Cl. 424-47.000.
Micco, Alexander J.: *See*—
Sodal, Ingvar E.; Hoivik, Lars; Micco, Alexander J.; Weil, John V.; and Baer, Norman W., 3,926,209.
Michalko, Edward, to Universal Oil Products Company. Method of catalyst manufacture. 3,926,849, Cl. 252-448.000.
Michelet, Daniel; and Razoutz, Michel, to Rhone-Poulenc. Process for the preparation of trimethyl-para-benzaquinone. 3,927,045, Cl. 260-396.00R.
Michell, Samuel S.: *See*—
Gaudet, Ronald M.; Michell, Samuel S.; and Kozy, Michael J., 3,926,806.
Michelson, Gunnar P.; and Ule, Louis A. High speed engine valve actuator. 3,926,159, Cl. 123-90.110.
Michurov, Jury Ivanovidh: *See*—
Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovidh; Zakharova, Nina Vasilievna; Golubenko, Mikhail Afanasievich; Tolstikov, Genrikh Alexandrovich; Kholodovskaya, Rakhil Samoilovna; Shalimova, Zoya Stepanovna; Legostaeva, Taisia Vasilievna; Popov, Vasily Dmitrievich; and Dolidze, Vladimir Romanovich, 3,927,038.
Midland-Ross Corporation: *See*—
Kurichh, Sham L.; and Acre, Leon R., 3,926,094.
Midrex Corporation: *See*—
Beggs, Donald; and Ahrendt, William A., 3,926,617.
Midwest Chrome Process Company: *See*—
Hage, Jacob M., 3,926,569.
Midwest Mechanical Services, Inc.: *See*—
El Dorado, James H., 3,926,104.
Miesel, John L., to Eli Lilly and Company. 4-Substituted-5,7-dinitro-2-(α,α-difluoroalkyl)benzimidazole compounds. 3,927,020, Cl. 260-309.200.
Mihailovski, Alexander, to Stauffer Chemical Company. Thioureido sulfonanilide compositions. 3,927,086, Cl. 260-552.00R.
Mihailovski, Alexander, to Stauffer Chemical Company. Method of controlling pests with thioureido carbamates compounds. 3,927,219, Cl. 424-300.000.
Mihailovski, Alexander, to Stauffer Chemical Company. Method of controlling pests with thioureido sulfonanilide compounds. 3,927,220, Cl. 424-321.000.
Mihara, Kuniyuki: *See*—
Ishizuka, Shinichi; and Mihara, Kuniyuki, 3,926,078.
Mikami, Tetuo: *See*—
Morioka, Minoru; and Mikami, Tetuo, 3,926,274.
Mikulin, Tom T. Structural member and method of making the same. 3,925,949, Cl. 52-581.000.
Miles, Jeffrey M., to Hercules Incorporated. Clear perfumed polyamide resin and method of making it. 3,926,655, Cl. 106-243.000.
Milgo Electronics Corporation: *See*—
Roedel, Charles W.; and Borysiewicz, Richard, 3,927,265.
Militz, Uwe: *See*—
Wefers, Norbert; Militz, Uwe; Unglaube, Uwe; and Schwarzkopf, Joachim, 3,927,303.
Miller, Alfred H.; and Wheat, Lawrence C., to Libbey-Owens-Ford Company. Sheet article transfer apparatus. 3,926,298, Cl. 198-20.00R.
Miller, David M., to Corning Glass Works. Sintered cordierite glass-ceramic bodies. 3,926,648, Cl. 106-39.600.
Miller, Edward B.: *See*—
Pachmayr, Frank A.; and Miller, Edward B., 3,926,232.

Miller, Edward F.; and Hellmuth, Walter W., to Texaco Inc. Polybutenyl-alkylene polyamine-polyalkanol lubricant additive. 3,927,104, Cl. 260-584.00B.
Miller, Edward F.: *See—*
Marshall, Richard A.; and Miller, Edward F., 3,926,043.
Miller, Gerald K., to Nartron Corporation. Flow sensor and system. 3,926,045, Cl. 73-114.000.
Miller, Harold N.: *See—*
Rossi, Albert; Jacobson, Norman; and Miller, Harold N., 3,926,579.
Miller, Harry, to Sperry Rand Corporation. Helicopter flight path control. 3,927,306, Cl. 235-150.220.
Miller, Keith Roy Phillip. Boat hull construction. 3,925,837, Cl. 9-2.00R.
Miller, Stephen Allen: *See—*
Choi, Jae Hong; and Miller, Stephen Allen, 3,926,898.
Miller, Thomas John: *See—*
Jaeger, Raymond Edward; and Miller, Thomas John, 3,927,155.
Miller, William H.: *See—*
Bradley, Ronnie A.; Miller, William H.; and Sease, John D., 3,926,344.
Millhouse, Clifford J.: *See—*
McInnes, Robert, 3,926,666.
Milligan, Donald Dunn, to Triprint Pty. Ltd. Color printing method. 3,926,117, Cl. 101-211.000.
Minami, Norio: *See—*
Shimizu, Katsuhisa; and Minami, Norio, 3,926,878.
Miners, Frederick Barry: *See—*
Morris, Larry Roy; and Miners, Frederick Barry, 3,926,690.
Minnesota Mining and Manufacturing Company: *See—*
Fayling, Richard E., 3,927,393.
Gobran, Ramsis, 3,927,239.
Hargis, Billy M., 3,926,746.
Koshar, Robert J.; Husted, Donald R.; Wright, Charles D.; and Zollinger, Joseph La Mar, 3,927,103.
Minolta Camera Kabushiki Kaisha: *See—*
Toriumi, Shiro; and Yamagishi, Seiichi, 3,926,426.
Minssieux, Louis: *See—*
Marrast, Jacques; Minssieux, Louis; and Blondin, Eric, 3,926,257.
Mirarchi, Carl: *See—*
Mauceri, Albert; and Mirarchi, Carl, 3,926,394.
Mitchell, Daniel M.; and Ternowski, Robert H., to Rockwell International Corporation. Current limited self-saturating dc/dc converter. 3,927,363, Cl. 321-11.000.
Mitchell, Robert M.: *See—*
Dykes, Ralph E.; and Mitchell, Robert M., 3,925,959.
Miteva, Maria Pancheva: *See—*
Pissarev, Angel Nikolaev; Miteva, Maria Pancheva; Balabanov, Ivan Velev; and Peychev, Lyubomir Dimov, 3,926,495.
Mitsubhishi Gas Chemical company, Inc.: *See—*
Huang, Ching Yun; Shimizu, Senzo; and Adachi, Hiroyuki, 3,926,890.
Mitsubishi Chemical Company, Ltd.: *See—*
Ishida, Nakao; Okada, Tsutomu; and Kamata, Akira, 3,926,731.
Mitsubishi Chemical Industries, Ltd.: *See—*
Enokido, Nobuo; Murakami, Atsushi; Yamaguchi, Kazuo; Kanoh, Natsuki; Tanaka, Toru; Okano, Shigeaki; and Suzuki, Masatoshi, 3,926,929.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Tozawa, Minoru, 3,927,419.
Mitsubishi Gas Chemical Company, Inc.: *See—*
Yoshikawa, Yoshio; Sugio, Akitoshi; Kato, Tomotake; and Okazaki, Heizo, 3,927,190.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Watabe, Ken, 3,926,304.
Mitsubishi Kinzoku Kogyo Kabushiki Kaisha: *See—*
Okabe, Taijiro; Okuwaki, Akitsugu; and Nakabayashi, Shigetoshi, 3,927,177.
Mitsubishi Petrochemical Company Limited: *See—*
Watanabe, Yoshihisa; Imanari, Makoto; Nojiri, Naohiro; and Fuga, Nobuhiko, 3,926,915.
Mitsugi, Takashi: *See—*
Kondo, Eiji; and Mitsugi, Takashi, 3,926,728.
Mitsui & Co. Ltd.: *See—*
Adachi, Yoichi; and Harada, Yoshiharu, 3,926,750.
Mitsui Mining & Smelting Co., Ltd.: *See—*
Izumi, Sumio, 3,926,790.
Izumi, Sumio; and Tanaka, Hiroshi, 3,926,791.
Mitsui Shipbuilding & Engineering Co. Ltd.: *See—*
Isojima, Imao; Doi, Yuzuru; and Hara, Shinji, 3,926,290.
Mitsui Toatsu Chemicals, Incorporated: *See—*
Nitanai, Kiyoaki; Okubo, Atsuo; and Yamazaki, Hideo, 3,926,959.
Mitsutsuka, Masashi: *See—*
Horio, Takehiro; Tsuda, Katsuhisa; Imai, Tadashi; Mitsutsuka, Masashi; and Morise, Heiji, 3,926,417.
Miwa, Naoto: *See—*
Oki, Masami; Hori, Ryuzo; and Miwa, Naoto, 3,926,702.
Mixon, William R.: *See—*
Thomas, David G.; Mixon, William R.; and Hayes, Phil H., 3,926,799.
Miyadera, Yasuo; and Yokokura, Hisao, to Hitachi, Ltd. Polymers prepared from aromatic diaminoalkoxycarboxylamine compounds and dianhydrides and method for their preparation. 3,926,914, Cl. 260-47.0CP.
Miyazaki, Minematsu: *See—*
Fukuba, Kozo; Ogushi, Yasutomo; and Miyazaki, Minematsu, 3,926,990.
Miyazako, Taksuhi: *See—*
Horie, Ikutaro; Miyazako, Taksuhi; and Shimada, Takeo, 3,926,869.
Mizokami, Nariakira: *See—*
Nara, Kiyoshi; Ohta, Kazuhiko; Katamoto, Kazuyoshi; Mizokami, Nariakira; and Fukuda, Hideo, 3,926,973.
MI² : *See—*
Fretwell, Richard D., 3,927,263.
Mobil Oil Corporation: *See—*
Dickert, Joseph J., Jr.; and Heiba, El-Ahmadi I., 3,926,820.
Dickert, Joseph J., Jr.; and Rowe, Carleton N., 3,927,232.
Ladov, Edwin N., 3,926,819.
Owen, Hartley; and Demmel, Edward J., 3,926,778.
Owen, Hartley, 3,926,843.
Plank, Charles J.; Rosinski, Edward J.; and Schwartz, Albert B., 3,926,782.
Rollmann, Louis D., 3,927,171.
Williams, Sherrod A., 3,926,255.
Mochida, Seiji: *See—*
Aibe, Toshio; Mochida, Seiji; and Itoga, Kiyoshi, 3,926,590.
Modcom, Inc.: *See—*
Anderson, Roland M., 3,925,893.
MoDoKemi AB: *See—*
Lindenfors, Sven Georg; and Westberg, Sven-Olof Johan, 3,926,951.
Moe, Walter; and Meyers, Michael, to Aurora Products Corporation. Vertical game board and playing pieces including move setting mechanisms. 3,926,437, Cl. 273-131.00B.
Moister, Douglas E., Jr., to Burroughs Corporation. Method of attaching a flexible printed circuit board to a rigid printed circuit board. 3,926,360, Cl. 228-180.000.
Moksnes, F. Leslie: *See—*
Moksnes, Stephen L.; and Moksnes, F. Leslie, 3,926,427.
Moksnes, Stephen L.; and Moksnes, F. Leslie. Apparatus for separating sheets from a stack. 3,926,427, Cl. 271-9.000.
Molen, Ronald L., to Research Homes, Inc. Composite building structure. 3,925,938, Cl. 52-22.000.
Molnar, Albert E.; and Molnar, William J. Emergency escape sling. 3,926,278, Cl. 182-7.000.
Molnar nee Bako, Erzsebet: *See—*
Korbonits, Dezso; Harsanyi, Kalman; Molnar nee Bako, Erzsebet; Takacs, Kalman; Heja, Gergely; Bodnar, Janos; Bodrogi, Istvan; and Erodi, Judit, 3,927,025.
Molnar, William J.: *See—*
Molnar, Albert E.; and Molnar, William J., 3,926,278.
Monbaliu, Marcel Jacob; Priem, Jan Jozef; and Vrydaghs, Roger Henri. Silver halide element containing polymeric colour forming couplers. 3,926,436, Cl. 96-67.000.
Monitron Industries, Inc.: *See—*
Genest, Leonard J.; Feagin, Frederick E.; Cole, Sylvan; and Messner, Daryle, 3,926,021.
Monkhouse, Donald C., to Pfizer Inc. Tertiary alcohol stabilized E-series prostaglandins. 3,927,197, Cl. 424-45.000.
Monogram Industries, Inc.: *See—*
Wagenhals, Bruce E., 3,925,827.
Monsanto Company: *See—*
Alt, Gerhard H., 3,926,613.
Dobinson, Frank; and Pelezo, Chris A., 3,926,887.
English, Jerome J., 3,926,248.
Gaertner, Van R., 3,927,080.
Jones, Robert T., 3,926,679.
Preston, Jack, 3,926,923.
Smith, Lowell R., 3,926,758.
Stevens, Harry M., 3,927,172.
Stookey, Donald J., 3,926,927.
Monte, Alexander A.; and Chiang, Ching, to Mallinckrodt, Inc. Alkaline phosphatase assay. 3,926,735, Cl. 195-103.50R.
Montgomery, George R. Parking space barrier. 3,925,929, Cl. 49-35.000.
Moore, Warren A.: *See—*
Schuller, Frederick T.; and Moore, Warren A., 3,926,482.
More, Arthur Rowlatt; and Whittington, Robert John, to H. W. Wallace & Company, Limited. Method and apparatus for following the motion of a datum mark. 3,926,042, Cl. 73-88.00A.
Morf, Jacques, to Rhone-Poulenc-Textile. Gas turbine. 3,926,535, Cl. 415-203.000.
Morgan Construction Company: *See—*
Sieurin, Donald; and Kinnicutt, Roger, Jr., 3,926,382.
Morgan, John R.: *See—*
Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,926,772.
Mori, Kazuo: *See—*
Ishizumi, Kikuo; Mori, Kazuo; Yamamoto, Michihiro; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 3,926,993.
Morimoto, Tomoaki: *See—*
Chibata, Ichiro; Ito, Hiroshi; Morimoto, Tomoaki; Taniguchi, Yukio; and Fujimoto, Tsuneo, 3,926,733.
Morioka, Minoru; and Mikami, Tetuo, to Honda Giken Kogyo Kabushiki Kaisha. Fuel tank apparatus for a motorized two-wheeled vehicle. 3,926,274, Cl. 180-35.000.
Morioka, Tadashi: *See—*
Nakajima, Eiichi; Morioka, Tadashi; Kurihara, Kozo; and Kobayashi, Takashi, 3,926,817.

Morise, Heiji: *See—*
Horio, Takehiro; Tsuda, Katsuhisa; Imai, Tadashi; Mitsutsuka, Masashi; and Morise, Heiji, 3,926,417.

Morita, Isao: *See—*
Tanaka, Hiroshi; and Morita, Isao, 3,926,282.

Moriyama, Itsuki; and Enomoto, Shigeo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic camera setting apparatus. 3,927,414, Cl. 354-195.000.

Moriyama, Kazuo; Iwato, Takashi; and Ohno, Morihiko, to Toyo Boseki Kabushiki Kaisha. Sulfonated phenylamino-halotriazine ordiazine surface modified aminated hydrophobic fibers and blends thereof with unmodified aminated hydrophobic fibers. 3,926,548, Cl. 8-115.500.

Mornas, Jean Philippe, to Compagnie des Ateliers et Forges de la Loire (St Chamond, Firminy, St Etienne, Jacob-Holtzer). Method and device for regulating the thickness of rolled products. 3,926,024, Cl. 72-8.000.

Morris, Larry Roy; and Miners, Frederick Barry, to Alcan Research and Development Limited. Aluminium alloys. 3,926,690, Cl. 148-32.000.

Moss, Cyril H. Fire safety systems. 3,926,101, Cl. 98-33.00R.

Mostmans, Joseph H.: *See—*
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 3,927,017.

Mote, Neil H.: *See—*
Heldenbrand, Stanley W.; Johnson, David L.; and Mote, Neil H., 3,926,428.

Motegi, Masayosi: *See—*
Sugai, Tetuya; Soga, Hiromu; Motegi, Masayosi; and Kanno, Hideo, 3,927,394.

Motorenfabrik Hatz KG: *See—*
Hatz, Ernst; and Schmuck, Johann, 3,926,155.

Motorola, Inc.: *See—*
Vieilleribiere, Henry, 3,927,338.

Mowdood, Syed K., to Goodyear Tire & Rubber Company, The. Reduction of reactor fouling and improvement in the thermal stability of pvc using nitrites. 3,926,910, Cl. 260-45.95R.

Moxham, Kenneth Ewing: *See—*
Andrew, Paul Hugh Finden; and Moxham, Kenneth Ewing, 3,925,999.

Moyer, Patricia H.: *See—*
Beard, William Q., Jr.; Moyer, Patricia H.; and Penner, Siegfried E., 3,926,847.

Moyers, Steven M., to United States of America, Energy Research and Development Administration. Pipe gripper. 3,925,874, Cl. 29-282.000.

Mucha, Richard C.: *See—*
Weingrad, Saul; Wahl, Albert J.; Mucha, Richard C.; and Gould, Robert E., 3,926,710.

Muehlhausen, Herbert N.; and Unger, John J., to Sunbeam Corporation. Plastic collar percolator. 3,926,350, Cl. 222-475.000.

Mueller, Heinz E., to Martin Marietta Corporation. Fluid-dynamic shock ring for controlled flow separation in a rocket engine exhaust nozzle. 3,925,982, Cl. 60-242.000.

Mueller, Roger P.: *See—*
Filsinger, John F.; and Mueller, Roger P., 3,926,109.

Mulier, Pieter M. J.; Jirak, Thomas L.; and Kane, Lawrence M., to Medtronic, Inc. Method for determining the end of life of a pulse generator power source. 3,927,366, Cl. 324-29.500.

Muller, Heinz Konrad, to Sealol, Inc. Sliding ring seal. 3,926,442, Cl. 277-3.000.

Muller, Karl Adolf: *See—*
Feldman, Rainer; Biethan, Uwe; Muller, Karl Adolf; and Panoch, Hans Joachim, 3,927,141.

Muller, Marcel: *See—*
Furst, Andor; Buchschacher, Paul; Kagi, Dieter; Meier, Werner; Muller, Marcel; and Widmer, Erich, 3,927,032.

Multifastener Corporation: *See—*
Pouch, Thomas M.; and Ladouceur, Harold A., 3,926,236.
Wehner, William C., 3,926,235.

Muntz, Eric P.: *See—*
Azzarelli, Teodoro; Muntz, Eric P.; and Scott, Paul B., 3,927,322.

Murakami, Atsushi: *See—*
Enokido, Nobuo; Murakami, Atsushi; Yamaguchi, Kazuo; Kanoh, Natsuki; Tanaka, Toru; Okano, Shigeaki; and Suzuki, Masatoshi, 3,926,929.

Murakawa, Yoshiyuki: *See—*
Kiyonaga, Kingo; and Murakawa, Yoshiyuki, 3,926,622.

Murase, Makoto: *See—*
Komatsu, Noboru; Kurauchi, Toshio; Murase, Makoto; and Negi, Kazuhiko, 3,926,866.

Murata, Tomoya: *See—*
Tsuchida, Takashi; Shinoda, Kenichi; Yamamoto, Kohei; Murata, Tomoya; and Maeda, Yoshihiro, 3,926,678.

Murch, Robert M., to United States of America, Navy. Haloalkoxy derivatives of the cyclophosphonitrilic chloride-hexamethylphosphoramide adduct. 3,927,147, Cl. 260-927.00N.

Murchison, Craig B., to Dow Chemical Company, The. Cyanide enhancement of the photooxidation of acetic acid. 3,926,803, Cl. 210-63.000.

Murray, Robert L.: *See—*
Madden, Michael J.; Murray, Robert L.; Lemon, Stephen C.; and Ostand, Paul R., 3,926,231.

Musgrove, Ronald R.; and Connelly, Lloyd E., to Emcee Corporation. Grain milling device. 3,926,380, Cl. 241-248.000.

Mustoe, David L.: *See—*
Fenerty, Michael J.; and Mustoe, David L., 3,926,443.

Muth, Karl: *See—*
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Hitzel, Volker, 3,927,088.

Muth, Robert M., to Honeywell Information Systems Inc. Toner concentration detector. 3,926,145, Cl. 118-7.000.

Myers, Walter E.: *See—*
Eaton, John Littell, Jr.; Brill, Richard Henry; and Myers, Walter E., 3,926,333.

Nabisco, Inc.: *See—*
Rosenquest, Allen H.; Knipper, Aloysius J.; and Wood, Robert W., 3,927,222.

Nacci, Valentine, to Lawrence Peska Associates, Inc., a part interest. Ski race game. 3,926,435, Cl. 273-86.00C.

Nada, Naohiro; and Yamashita, Tadaoki, to Matsushita Electric Industrial Co., Ltd. Process for preparing phosphor for thermoluminescent radiation dosimeter. 3,926,836, Cl. 252-301.40R.

Nadasi, Laszlo; Nadasi, Marton; Zelenko, John; and Pero, Donald E., to City Auto Upholstering Co. Construction and process for ornamental car top. 3,926,471, Cl. 296-137.00R.

Nadasi, Marton: *See—*
Nadasi, Laszlo; Nadasi, Marton; Zelenko, John; and Pero, Donald E., 3,926,471.

Nadelson, Jeffrey: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 3,927,079.

Nadolski, Klaus: *See—*
Ersfeld, Heinrich; Nadolski, Klaus; Schneider, Walter; Schulte, Klaus; and Boden, Heinrich, 3,926,219.

Nagahara, Yasumori, to Ricoh Co., Ltd. Photoreceptor changing apparatus for electrophotographic copying machines. 3,926,515, Cl. 355-3.00R.

Nagahara, Yasumori, to Ricoh Company Ltd. Residual powered developer homogenizer for electrophotographic device. 3,926,517, Cl. 355-3.0DD.

Nagahara, Yasumori: *See—*
Satomi, Toyokazu; Nagahara, Yasumori; and Narita, Teruo, 3,926,429.

Nagao, Nobuo: *See—*
Tomoda, Sadamichi; and Nagao, Nobuo, 3,927,166.

Naidoff, Robert J., to Raychem Corporation. Welded polymeric articles and process. 3,927,233, Cl. 428-58.000.

Naito, Okito, to Kabushiki Kaisha Suwa Seikosha. Time correcting arrangement for electronic wrist watches. 3,925,978, Cl. 58-23.00R.

Nakabayashi, Shigetoshi: *See—*
Okabe, Taijiro; Okuwaki, Akitsugu; and Nakabayashi, Shigetoshi, 3,927,177.

Nakagawa, Jihei, to Olympus Optical Company Limited. Telephoto lens system. 3,926,507, Cl. 350-216.000.

Nakagawa, Kunio: *See—*
Kogure, Katsura; Koyama, Hiroyasu; and Nakagawa, Kunio, 3,927,084.

Nakagawa, Tadao, to Nisshin Kogyo Kabushiki Kaisha. Oil-hydraulic servo-motor. 3,926,093, Cl. 91-391.00R.

Nakajima, Eiichi; Morioka, Tadashi; Kurihara, Kozo; and Kobayashi, Takashi, to Sankyo Company Limited. Glidants and process for preparing the same. 3,926,817, Cl. 252-11.000.

Nakajima, Keiji: *See—*
Horiguchi, Shojiro; Nakamura, Michiei; Nakajima, Keiji; and Seino, Yoshio, 3,926,830.

Nakamura, Kenji; Fukuyama, Kunihiko; and Yamamoto, Takuo, to Rion Kabushiki Kaisha. Hearing aid. 3,927,279, Cl. 179-107.0FD.

Nakamura, Kotaro: *See—*
Arai, Atsuaki; Oishi, Yasushi; Yamada, Minoru; Furutachi, Nobuo; and Nakamura, Kotaro, 3,926,631.

Nakamura, Michiei: *See—*
Horiguchi, Shojiro; Nakamura, Michiei; Nakajima, Keiji; and Seino, Yoshio, 3,926,830.

Nakanishi, Michio; Yokobe, Tetsuo; Arai, Tomio; and Abe, Masao, to Yoshitomi Pharmaceutical Industries, Ltd. 2-Aminoalkyl-1-(pyridylcarbonylphenyl)imidazole compounds. 3,927,011, Cl. 260-296.00R.

Nakanishi, Yoshiyuki: *See—*
Ono, Tetsuji; Nakanishi, Yoshiyuki; Suzuki, Takehiko; and Okuda, Yukio, 3,926,846.

Nakao, Yukimichi: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,927,114.

Nakashima, Akio; and Arakawa, Yoshihiro, to Hitachi, Ltd. Signal phase detector. 3,927,331, Cl. 307-232.000.

Nakatan: *See—*
Shibata, Yutaka; Kodera, Yoshiaki; Tanaka, Mitsuru; Kamiyama, Fumio; and Nakatan, 3,926,918.

Nakaya, Naohisa, to Iwasaki Tsushinki Kabushiki Kaisha. Sampling oscilloscope circuit. 3,927,374, Cl. 328-151.000.

Nara, Kiyoshi; Ohta, Kazuhiko; Katamoto, Kazuyoshi; Mizokami, Nariakira; and Fukuda, Hideo, to Takeda Chemical Industries, Ltd. Method for separating cephalosporin C. 3,926,973, Cl. 260-243.00C.

Nara, Kiyoshi: *See—*
Kanzaki, Toshihiko; Fujisawa, Yukio; Shirafuji, Hideo; Nara, Kiyoshi; and Yoneda, Masahiko, 3,926,729.

Narayanan, Venkatachala L.: *See—*
Haugwitz, Rudiger D.; and Narayanan, Venkatachala L., 3,926,967.

Rovnyak, George; Narayanan, Venkatachala L.; Haughwitz, Rudiger D.; and Cimarusti, Christopher M., 3,926,982.
Rovnyak, George; Narayanan, Venkatachala L.; Haugwitz, Rudiger D.; and Cimarusti, Christopher M., 3,927,014.

Narducci, Michael C.: *See—*
Maillaro, Felix, 3,926,494.

Narita, Teruo: *See—*
Satomi, Toyokazu; Nagahara, Yasumori; and Narita, Teruo, 3,926,429.

Nartron Corporation: *See—*
Miller, Gerald K., 3,926,045.

Narwicz, Charles A.: *See—*
Bjelland, Ronald W.; Narwicz, Charles A.; and Hetmanski, Casimir, 3,926,331.

National Can Corporation: *See—*
Openchowski, Richard A., 3,926,339.

National Patent Development Corporation: *See—*
Kliment, Karel; and Tu, Robert S., 3,925,895.

National Research Development Corporation: *See—*
Broadway, Alexander Richard William; Fong, William; and Rawcliffe, Gordon Hindle, 3,927,358.
Freeman, Michael Alexander Reykers; and Swanson, Sydney Alan Vasey, 3,925,824.
Hodson, David George; and Peat, Derek, 3,927,356.
Lowe, Gordon, 3,926,972.
Macleod, Norman, 3,926,215.

National Starch and Chemical Corporation: *See—*
Georgoudis, Paul C.; Ray-Chaudhuri, Dilip K.; and Flanagan, Thomas P., 3,926,920.
Micchelli, Albert L.; Legato, Gerard J.; Ganslaw, Stuart H.; and Schuler, Lawrence D., 3,927,199.

Naylor, Floyd E., to Phillips Petroleum Company. Catalysts for producing high trans-polybutadiene. 3,926,933, Cl. 260-94.300.

Neal, Robert W., to JBF Scientific Corporation. Floatage concentrating equipment for nautical floatage recovery apparatus. 3,926,812, Cl. 210-242.000.

Neckermann Versand KGaA: *See—*
Goeckel, Helmut, 3,927,262.

Neeloff, Victor, to Compagnie Generale d'Automatisme. Device for determining, during operation, the category of a vehicle according to a pre-established group of categories. 3,927,389, Cl. 340-38.00R.

Neely, Allan B., Jr. Bale handling apparatus. 3,926,319, Cl. 214-6.00B.

Neff, Frederick R., to A & A Engineering Co. Linear measuring apparatus. 3,926,062, Cl. 74-89.000.

Negi, Kazuhiko: *See—*
Komatsu, Noboru; Kurauchi, Toshio; Murase, Makoto; and Negi, Kazuhiko, 3,926,866.

Neilsen, Hildaur L. Deburring device with oppositely acting deburring elements. 3,926,031, Cl. 72-407.000.

Neitzel, Ulrich: *See—*
Effmert, Alexander; and Neitzel, Ulrich, 3,926,609.

Neman, Mary. Simplified silk screen printing device. 3,926,112, Cl. 101-123.000.

Neri, Paolo; Antoni, Guido; and Benvenuti, Franco, to Instituto Sieroterapico e Vaccinogeno Toscano "Sclavo" S.p.A. Use of α,β-poly-(aspartic acid)-hydroxyalkylamides as a plasma expander. 3,927,204, Cl. 424-78.000.

Nersesian, Leonard S. Accelerator pedal snap acting signaling device for establishing a predetermined force-distance characteristic. 3,926,275, Cl. 180-77.00R.

Nerstad, Karl A., to Caterpillar Tractor Co. Centrifugal clutch with overspeed relief valve. 3,926,288, Cl. 192-104.00F.

Nesterov, Jury Ivanovich: *See—*
Orlov, Petr Nikolaevich; Nesterov, Jury Ivanovich; Kudashov, Vasily Yakovlevich; Zimnyakov, Alexandr Vasilievich; Ermakova, Irina Nikolaevna; Bogomolov, Igor Vasilievich; Nirman, Efim Matveevich; and Sokolov, Vladimir Dmitrievich, 3,925,936.

Neumann, Wilhelm: *See—*
Wetzler, Josef; Neumann, Wilhelm; and Hesselman, Karlheinz, 3,926,712.

Neumer, John Fred, to Du Pont de Nemours, E. I., and Company. Disperse bisanil dyes derived from diaminomaleonitrile and their preparation. 3,927,065, Cl. 260-465.00E.

New Brunswick Scientific Co., Inc.: *See—*
Nyiri, Laszlo P.; Humphrey, Arthur E.; and Harmes, Clyde S., III, 3,926,738.
Wilson, John D.; Nyiri, Laszlo K.; Humphrey, Arthur E.; and Harmes, Clyde S., III, 3,926,737.

Newby, Kenneth Russ; and Winters, Earl Dallas, to Bell Telephone Laboratories, Incorporated. Selective electrodeposition of gold on electronic devices. 3,926,747, Cl. 204-15.000.

Newcombe, George M.: *See—*
Jordan, John E.; and Newcombe, George M., 3,927,178.

Newcor, Inc.: *See—*
Parker, Frank S., 3,927,355.

NGK Insulators, Ltd.: *See—*
Wada, Shigetaka; and Yamamoto, Noboru, 3,927,300.

Nickel, Horst; and Schundehutte, Karl-Heinz, to Bayer Aktiengesellschaft. Polyhydroxyalkylamine salts of anionic dyestuffs. 3,926,546, Cl. 8-12.000.

Nickel, Hubertus: *See—*
Luhleich, Hartmut; Nickel, Hubertus; and Dias, Francesco, 3,927,187.

Nickerson, Bryan W., Jr. Auxiliary traction means for vehicle wheels. 3,926,240, Cl. 152-226.000.

Nicklin, John Mills, to John Edward Butler (New Zealand) Ltd. Belt couplings. 3,925,853, Cl. 24-75.000.

Nidola, Antonio: *See—*
De Nora, Oronzio; Bianchi, Giuseppe; Nidola, Antonio; and Trisoglio, Giovanni, 3,926,751.

Niedrach, Leonard W.; and Stoddard, William H., Jr., to General Electric Company. Miniature probe containing multifunctional electrochemical sensing electrodes. 3,926,766, Cl. 204-195.00P.

Nielsen, Verner Henrick: *See—*
Chatfield, Eric John; and Nielsen, Verner Henrick, 3,927,320.

Nightingale, Eric Gordon: *See—*
Jungles, John; Whitehouse, David John; and Nightingale, Eric Gordon, 3,927,253.

Nihon Emulsion Co., Inc.: *See—*
Ichikawa, Tomomichi; and Fukami, Sigetosi, 3,927,047.

Niida, Taro: *See—*
Kondo, Shinichi; Sezaki, Masaji; Koike, Makiko; Shimura, Masaru; Akita, Eiichi; Satoh, Kimio; Hamamoto, Kazuko; Niida, Taro; and Hara, Takeshi, 3,926,948.
Tsuruoka, Takashi; Niwa, Tomizo; Shibata, Uichi; Inouye, Shigeharu; and Niida, Taro, 3,927,001.

Niimi, Itaru; Kaneko, Yasuhisa; Noda, Fumiyoshi; and Tsuzuki, Yoshihiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Process for preparing hollow balls of silicon carbide and product formed thereby. 3,927,181, Cl. 423-345.000.

Nikitenko, Alexandr Alexandrovich: *See—*
Ivanov, Mikhail Ivanovich; From, Anatoly Alexandrovich; Kiseley, Anatoly Efimovich; Nikitenko, Alexandr Alexandrovich; Rusanov, Valentin Mikhailovich; and Skobelev, Leonid Ivanovich, 3,926,939.

Nikolaeva, Irina Sergeevna: *See—*
Grinev, Alexei Nikolaevich; Shvedov, Vasily Ivanovich; Sytina, Evgenia Nikolaevna; Bogdanova, Nadezhda Sergeevna; Nikolaeva, Irina Sergeevna; Pershin, Grigory Nikolaevich; and Guskova, Tatyana Anatolievna, 3,927,125.

Nippon Chemical Industrial Co., Ltd.: *See—*
Okabe, Taijiro; Okuwaki, Akitsugu; and Nakabayashi, Shigetoshi, 3,927,177.

Nippon Electric Company, Ltd.: *See—*
Furuhashi, Tokio, 3,927,333.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
Fujita, Yukio; Kawasaki, Iwao; and Nishikawa, Hideo, 3,926,796.
Fukushima, Mitio; and Iwanami, Teruo, 3,926,876.

Nippon Hoso Kyokai Hitachi Ltd.: *See—*
Yoshino, Takehiko; Yanagimachi, Akio; Uehara, Takashi; Takezawa, Teruhiro; Fukuda, Masaaki; and Kayano, Tatsuo, 3,927,269.

Nippon Kakokicompany, Limited: *See—*
Okamoto, Chikashi, 3,926,332.

Nippon Kogaku K. K.: *See—*
Kimura, Shuji; and Takahata, Kouichi, 3,927,413.

Nippon Kogaku K.K.: *See—*
Wakabayashi, Hiroshi, 3,926,493.

Nippon Piston Ring Co., Ltd.: *See—*
Sugahara, Eisuke, 3,926,074.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Ono, Tetsuji; Nakanishi, Yoshiyuki; Suzuki, Takehiko; and Okuda, Yukio, 3,926,846.

Nippon Soda Company, Limited: *See—*
Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; Ishikawa, Hisao; Yamada, Shozo; Yasuda, Yasushi; and Asada, Mitsuo, 3,927,034.

Nippon Steel Corporation: *See—*
Gondo, Hisashi; Eguchi, Naoki; Yoshimura, Takafumi; and Araki, Masaki, 3,926,687.
Horio, Takehiro; Tsuda, Katsuhisa; Imai, Tadashi; Mitsutsuka, Masashi; and Morise, Heiji, 3,926,417.
Sugai, Tetuya; Soga, Hiromu; Motegi, Masayosi; and Kanno, Hideo, 3,927,394.
Yoshioka, Kengo; and Shiraishi, Teruhiko, 3,926,289.

Nippon Telegraph and Telephone Public Corporation: *See—*
Sato, Yashuhiro; and Hirabara, Chikao, 3,927,381.

Nippon Tsu Shin Kogyo K.K.: *See—*
Kunimine, Isao, 3,927,283.
Tsutsumi, Fumio; and Kerman, Stephen, 3,927,278.

Nirman, Efim Matveevich: *See—*
Orlov, Petr Nikolaevich; Nesterov, Jury Ivanovich; Kudashov, Vasily Yakovlevich; Zimnyakov, Alexandr Vasilievich; Ermakova, Irina Nikolaevna; Bogomolov, Igor Vasilievich; Nirman, Efim Matveevich; and Sokolov, Vladimir Dmitrievich, 3,925,936.

Nirschl, Robert P. Muscular support. 3,926,186, Cl. 128-165.000.

Nishikawa, Hideo: *See—*
Fujita, Yukio; Kawasaki, Iwao; and Nishikawa, Hideo, 3,926,796.

Nishikawa, Yoichi: *See—*
Fujiwara, Susumu; Okada, Takao; Koyama, Masao; Akashi, Hiromitsu; and Nishikawa, Yoichi, 3,927,309.

Nishimura, Katsuo: *See—*
Tanaka, Eiichiro; Nishimura, Katsuo; Shimizu, Hiroshi; and Koshi, Masao, 3,926,502.

Nishiwaki, Hiroshi, to Unitika Ltd.; and Katsura Roller Mfg. Co., Ltd. Method and covering fabric for a damping form roller of an offset printing machine. 3,926,701, Cl. 156-86.000.

Nisshin Flour Milling Co., Ltd.: *See—*
Kogure, Katsura; Koyama, Hiroyasu; and Nakagawa, Kunio, 3,927,084.

Nisshin Kogyo Kabushiki Kaisha: *See*—
Nakagawa, Tadao, 3,926,093.
Nitanai, Kiyoaki; Okubo, Atsuo; and Yamazaki, Hideo, to Mitsui Toatsu Chemicals, Incorporated. Penicilline derivatives. 3,926,959, Cl. 260-239.100.
Niwa, Tomizo: *See*—
Tsuruoka, Takashi; Niwa, Tomizo; Shibata, Uichi; Inouye, Shigeharu; and Niida, Taro, 3,927,001.
Nixdorf Computer AG: *See*—
Wefers, Norbert; Militz, Uwe; Unglaube, Uwe; and Schwarzkopf, Joachim, 3,927,303.
Nobel Hoechst Chimie: *See*—
Savostianoff, Dimitri; and Dubos, Denise, 3,927,024.
Noda, Fumiyoshi: *See*—
Niimi, Itaru; Kaneko, Yasuhisa; Noda, Fumiyoshi; and Tsuzuki, Yoshihiro, 3,927,181.
Nojiri, Naohiro: *See*—
Watanabe, Yoshihisa; Imanari, Makoto; Nojiri, Naohiro; and Fuga, Nobuhiko, 3,926,915.
Noll, Ewald; Schaefer, Hans; Schmid, Horst; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the recovery of acrylic acid and acrolein. 3,926,744, Cl. 203-55.000.
Noll, Walter: *See*—
Golitz, Hans Dietrich, deceased; Wagner, Kuno; Quiring, Bernd; and Noll, Walter, 3,927,042.
Nonaka, Koushi: *See*—
Hayashi, Noriyuki; Sasaki, Kenji; Inaba, Hideaki; and Nonaka, Koushi, 3,927,144.
Nordberg, Kurt, to Vianova-Kunstharz, A. G. Process for producing non-aqueous polymer dispersions. 3,926,899, Cl. 260-33.40R.
Nordgren, Simon Nils. Combined adjustable spanner and ratchet wrench. 3,926,077, Cl. 81-126.000.
Nordine, Louis R., to Stanley Aviation Corporation. Fail-safe ballistic parachute spreader apparatus. 3,926,391, Cl. 244-149.000.
Noren, John Paul: *See*—
Pulk, Elgas, deceased; Hallsenius, Carlgustaf, Administrator; and Noren, John Paul, 3,926,345.
Norman, Melvin H.: *See*—
Gripe, William B.; and Norman, Melvin H., 3,926,444.
Norman, Robert M. Bouyancy and attitude correction method and apparatus. 3,926,003, Cl. 61-72.400.
Norris, Leon F.: *See*—
Fustukian, David A. W.; Kushnir, Bud W.; Norris, Leon F.; and Fraser, Robert W., 3,926,691.
Northern Eelectric Company Limited,: *See*—
Richardson, Walter Lorne, 3,926,072.
Northup, John D. Thread mold. 3,926,401, Cl. 249-59.000.
Nose, Shinji; Tokuda, Shingo; Tanaka, Motomu; and Tsujimura, Hideaki, to Osaka Soda Co., Ltd. Flame retardant hardenable composition of water glass and decorative products made by using the same. 3,926,905, Cl. 260-42.430.
Novagard Corporation: *See*—
Meyers, Robert M.; Kutch, Edward F.; and Sitter, Matthew M., 3,925,947.
Nudelman, Abraham; and McCaully, Ronald J., to American Home Products Corporation. Cephalosporin derivatives. 3,926,974, Cl. 260-243.00C.
Nyiri, Laszlo K.: *See*—
Wilson, John D.; Nyiri, Laszlo K.; Humphrey, Arthur E.; and Harmes, Clyde S., III, 3,926,737.
Nyiri, Laszlo P.; Humphrey, Arthur E.; and Harmes, Clyde S., III, to Wilson, John D.; and New Brunswick Scientific Co., Inc. Method and apparatus for control of biochemical processes. 3,926,738, Cl. 195-127.000.
Nystrand, Ernst Daniel: *See*—
Bradley, John J.; and Nystrand, Ernst Daniel, 3,926,299.
O & K Orenstein & Koppel Aktiengesellschaft: *See*—
Herms, Heinrich, 3,926,301.
Oberschwabische Metallwarenfabrik GmbH & Co. K.G.: *See*—
Theisen, Gunter, 3,927,243.
O'Brien, James W.: *See*—
Bornhorst, Walter J.; Coleman, Steven J.; and O'Brien, James W., 3,926,196.
Occhipinti, Carl, to Bunker Ramo Corporaation. Connector receptacle. 3,926,496, Cl. 339-65.000.
Oce-van der Grinten N.V.: *See*—
van der Sterren, Martin Leonard, 3,926,625.
O'Connell, Harry P., Jr.; and Hopster, Eugene E., to Donn H. Gross. Building. 3,925,940, Cl. 52-81.000.
Oden, Volker: *See*—
Gudernatsch, Hugo; Jaekel, Gerhart; Kroll, Wolfgang; Oden, Volker; and Reinhardt, Konrad, 3,926,810.
Odle, John D.: *See*—
Suggitt, Robert M.; and Odle, John D., 3,927,135.
Suggitt, Robert M.; and Odle, John D., 3,927,136.
Officine Galileo S.p.A.: *See*—
Ferri, Walter; and Grassotti, Giulio, 3,925,897.
Oganowski, Kasimir: *See*—
Dunbar, Frank C.; and Oganowski, Kasimir, 3,926,572.
Ogura, Shuichi; Chow, Hirotsura; and Kawamata, Toshio, to Fuji Photo Film Co., Ltd. Composite film. 3,927,244, Cl. 428-483.000.
Ogushi, Yasutomo: *See*—
Fukuba, Kozo; Ogushi, Yasutomo; and Miyazaki, Minematsu, 3,926,990.
Ohfuka, Toshio; Schichijo, Yoshihisa; Ichikawa, Yasushi; and Yamamoto, Katsuo, to Asahi Kasei Kogyo Kabushika Kaisha. Hygroscopic acrylic synthetic fibers and method for preparing the same. 3,926,930, Cl. 260-85.50S.
Ohishi, Masateru, to Konan Electric Company, Ltd. Fluid logic programmer. 3,926,217, Cl. 137-596.180.
Ohkawa, Hideo: *See*—
Tomikawa, Masami; Ohkawa, Hideo; and Tsunoda, Akiji, 3,927,159.
Ohno, Morihiko: *See*—
Moriyama, Kazuo; Iwato, Takashi; and Ohno, Morihiko, 3,926,548.
Ohno, Yoshitomo; Takigawa, Yasuko; Aoki, Katsuo; and Yashiki, Takatsuka, to Takeda Chemical Industries, Ltd. Aqueous suspension of pharmaceuticals. 3,927,205, Cl. 424-80.000.
Ohta, Kazuhiko: *See*—
Nara, Kiyoshi; Ohta, Kazuhiko; Katamoto, Kazuyoshi; Mizokami, Nariakira; and Fukuda, Hideo, 3,926,973.
Oishi, Michiro: *See*—
Takahashi, Yasuo; and Oishi, Michiro, 3,926,503.
Oishi, Yasushi: *See*—
Arai, Atsuaki; Oishi, Yasushi; Yamada, Minoru; Furutachi, Nobuo; and Nakamura, Kotaro, 3,926,631.
Sugizaki, Atsushi; Hirose, Takeshi; Yokota, Yukio; Okumura, Akio; Oishi, Yasushi; and Arai, Atsuaki, 3,926,634.
Okabe, Taijiro; Okuwaki, Akitsugu; and Nakabayashi, Shigetoshi, to Mitsubishi Kinzoku Kogyo Kabushiki Kaisha; and Nippon Chemical Industrial Co., Ltd. Removal of nitrogen oxides from gaseous mixtures using aqueous alkaline manganate or permanganate solutions. 3,927,177, Cl. 423-235.000.
Okada, Takao: *See*—
Fujiwara, Susumu; Okada, Takao; Koyama, Masao; Akashi, Hiromitsu; and Nishikawa, Yoichi, 3,927,309.
Okada, Toshio; Shimano, Yasunao; and Sakurada, Ichiro, to Japan Atomic Energy Research Institute. Method of making durable antistatic and hygroscopic polyester fibers. 3,926,551, Cl. 8-115.500.
Okada, Tsutomu: *See*—
Ishida, Nakao; Okada, Tsutomu; and Kamata, Akira, 3,926,731.
Okamoto, Chikashi, to Nippon Kakokicompany, Limited. Sealing structure for a liquid storage vessel having a floating head. 3,926,332, Cl. 220-226.000.
Okamoto, Keiji, to Yazaki Sogyo Kabushiki Kaisha. Meter. 3,926,142, Cl. 116-116.000.
Okamoto, Tadashi: *See*—
Tobiki, Hisao; Okamoto, Tadashi; and Akiyama, Hisao, 3,927,054.
Okano, Shigeaki: *See*—
Enokido, Nobuo; Murakami, Atsushi; Yamaguchi, Kazuo; Kanoh, Natsuki; Tanaka, Toru; Okano, Shigeaki; and Suzuki, Masatoshi, 3,926,929.
Okazaki, Heizo: *See*—
Yoshikawa, Yoshio; Sugio, Akitoshi; Kato, Tomotake; and Okazaki, Heizo, 3,927,190.
Oke Rainer von der Heyde & Co.: *See*—
Tillner, Alfred, 3,925,861.
Oki Electric Industry Co., Ltd.: *See*—
Sato, Yashuhiro; and Hirabara, Chikao, 3,927,381.
Oki, Masami; Hori, Ryuzo; and Miwa, Naoto, to Asamura Patent Office. Ceramic structures and process for producing the same. 3,926,702, Cl. 156-89.000.
Oki, Ryuji, to Sony Corporation. Amplifying circuit. 3,927,382, Cl. 330-29.000.
Okubo, Atsuo: *See*—
Nitanai, Kiyoaki; Okubo, Atsuo; and Yamazaki, Hideo, 3,926,959.
Okuda, Yukio: *See*—
Ono, Tetsuji; Nakanishi, Yoshiyuki; Suzuki, Takehiko; and Okuda, Yukio, 3,926,846.
Okumura, Akio: *See*—
Sugizaki, Atsushi; Hirose, Takeshi; Yokota, Yukio; Okumura, Akio; Oishi, Yasushi; and Arai, Atsuaki, 3,926,634.
Okura, Keniti: *See*—
Hibi, Tadatoshi; and Okura, Keniti, 3,926,441.
Okuwaki, Akitsugu: *See*—
Okabe, Taijiro; Okuwaki, Akitsugu; and Nakabayashi, Shigetoshi, 3,927,177.
Olean Case Corporation: *See*—
Sullivan, Lyle L., 3,926,308.
Olin Corporation: *See*—
Wojtowicz, John A., 3,927,074.
Olovson, Gudmar. Button retainer. 3,925,855, Cl. 24-90.0PR.
Olympus Optical Co., Ltd.: *See*—
Hama, Hiroyuki, 3,926,501.
Maeda, Haruo, 3,926,506.
Matsubara, Masaki, 3,925,910.
Nakagawa, Jihei, 3,926,507.
O'Mahony, Gerard M.; and Paterson, James G. T., to Interdye Technology Corporation. Method and apparatus for space dyeing yarn. 3,926,547, Cl. 8-14.000.
O'Neill, John J.; Komor, Joseph A.; Babcock, Thomas E.; Edmundson, Robert J.; and Shay, Edward G., to Avon Products, Inc. Method of making transparent soap bars. 3,926,828, Cl. 252-117.000.
O'Neill, Roger M.; and Kennedy, John B., Jr., to Continental Can Company, Inc. Method of measuring concentration ratios of a mixture of materials. 3,926,337, Cl. 222-1.000.
Ono, Tetsuji; Nakanishi, Yoshiyuki; Suzuki, Takehiko; and Okuda, Yukio, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Catalysts for the preparation of phthalic anhydride. 3,926,846, Cl. 252-435.000.

Ontario Research Foundation: *See—*
Chatfield, Eric John; and Nielsen, Verner Henrick, 3,927,320.

Openchowski, Richard A., to National Can Corporation. Liquid dispensing apparatus having plural can piercing tools. 3,926,339, Cl. 222-83.000.

Orekhov, Anatoly Alexandrovich: *See—*
Svirschevsky, Valentin Konstantinovich; Orekhov, Anatoly Alexandrovich; Tregubov, Boris Grigorievich; and Trofimuk, Andrei Alexeevich, 3,926,267.

Original Hanau Quarzlampen GmbH: *See—*
Herold, Franz Dieter, 3,927,313.

Orliaguet, Maurice, to M.A.J. Device for packaging and preserving sterilized products under vacuum in plastic packs, in particular linen. 3,925,961, Cl. 53-89.000.

Orlov, Petr Nikolaevich; Nesterov, Jury Ivanovich; Kudashov, Vasily Yakovlevich; Zimnyakov, Alexandr Vasilievich; Ermakova, Irina Nikolaevna; Bogomolov, Igor Vasilievich; Nirman, Efim Matveevich; and Sokolov, Vladimir Dmitrievich. Lapping machine. 3,925,936, Cl. 51-118.000.

Orwin, Olaf John Barclay, to Redman Fisher Engineering Limited. Power and free conveyor. 3,926,125, Cl. 104-94.000.

Osaka Soda Co., Ltd.: *See—*
Nose, Shinji; Tokuda, Shingo; Tanaka, Motomu; and Tsujimura, Hideaki, 3,926,905.

Ostand, Paul R.: *See—*
Madden, Michael J.; Murray, Robert L.; Lemon, Stephen C.; and Ostand, Paul R., 3,926,231.

Oswald, Alexis A.; and Valint, Paul L., Jr., to Exxon Research & Engineering Company. O,S'-Dialkyl-S-hydrocarbylthioalkyl dithiophosphates. 3,927,148, Cl. 260-948.000.

Otey, Felix H.; Westhoff, Richard P.; and Mehltretter, Charles L., to United States of America, Agriculture. Flame-retardant polyurethane foams. 3,926,868, Cl. 260-2.5AS.

Otten, Leonard J., III, to United States of America, Air Force. System for measuring unsteady aerodynamic torques. 3,926,046, Cl. 73-133.00R.

Otto, Arlin W.: *See—*
Anderson, Noel M.; and Otto, Arlin W., 3,926,206.
Anderson, Noel M.; and Otto, Arlin W., 3,926,207.

Oulo Osakeyhtio: *See—*
Lehtinen, Timo Pellervo, 3,926,936.

Oushiba, Takashi, to Showa Denko Kabushiki Kaisha. Method for oxidizing nitrogen oxides. 3,927,183, Cl. 423-393.000.

Ovutime, Inc.: *See—*
Kopito, Louis; Schuster, Samuel R.; and Kosasky, Harold, 3,926,037.

Owen, Hartley; and Demmel, Edward J., to Mobil Oil Corporation. Method and system for controlling the activity of a crystalline zeolite cracking catalyst. 3,926,778, Cl. 208-74.000.

Owen, Hartley, to Mobil Oil Corporation. FCC — multi-stage regeneration procedure. 3,926,843, Cl. 252-417.000.

Owens-Corning Fiberglas Corporation: *See—*
de Paul Clark, Vincent, 3,926,894.
Shannon, Richard F.; and Helser, Jerry L., 3,926,653.
Stalego, Charles J., 3,926,600.

Owens-Illinois, Inc.: *See—*
Beck, Herman D.; and Cook, Thomas H., 3,926,362.
Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V., 3,927,342.
Gray, Don N.; Keyes, Melvin H.; and Semersky, Frank E., 3,926,734.
Levene, Leon, 3,927,224.
Pei, Yu K., 3,926,251.
Pellett, Fred G., 3,926,607.

Ozretich, Thomas M., to Crown Zellerbach Corporation. Process for monoetherification of polyhydric benzenes. 3,927,118, Cl. 260-613.00D.

P. Ferrero & C. S.p.A.: *See—*
Dogliotti, Amilcare, 3,926,314.

P.M. Andersen Manufacturing Pty. Limited: *See—*
Andersen, Peder John, 3,927,294.

P.R. Mallory & Co. Inc.: *See—*
Blanchard, James S.; and Weaver, Robert F., 3,926,067.
Curelop, Edward J.; and Marincic, Nikola, 3,926,672.
Hauenstine, Edgar F., 3,927,289.
Lipp, Ellis P., 3,927,276.
Utken, Jay; and Hauenstine, Edgar F., 3,927,288.

Pachmayr, Frank A.; and Miller, Edward B., to Pachmayr Gun Works, Inc. Apparatus for cutting pattern in gun stock or other work piece. 3,926,232, Cl. 144-136.00J.

Pachmayr Gun Works, Inc.: *See—*
Pachmayr, Frank A.; and Miller, Edward B., 3,926,232.

Pacific-Atlantic Products, Ltd.: *See—*
Walker, William S., 3,925,920.

Packard Instrument Company, Inc.: *See—*
Frank, Edmund; and Polic, Edward F., 3,926,323.

Packard, Norman M., to International Harvester Company. Ring manufacture, productive of line contact seal. 3,926,166, Cl. 123-193.00P.

Palencher, Jacques, to Lebocey Industrie. Gripper point for loom projectiles with an external feed. 3,926,225, Cl. 139-125.000.

Pallant, Joseph: *See—*
Johndrow, John Paul; and Pallant, Joseph, 3,926,474.

Pan-Nova, Inc.: *See—*
Burke, William F.; Crowell, Lee T.; Greenwood, Robert C.; and Jones, Thomas E., 3,926,291.

Panoch, Hans Joachim: *See—*
Feldman, Rainer; Biethan, Uwe; Muller, Karl Adolf; and Panoch, Hans Joachim, 3,927,141.

Paolinelli, Antonio: *See—*
Piccolo, Luigi; and Paolinelli, Antonio, 3,926,608.

Pape, Robert Carl: *See—*
Hagel, John Louis; Pape, Robert Carl; and Reinwall, Ernest William, Jr., 3,925,952.

Paper Converting Machine Company: *See—*
Bradley, John J.; and Nystrand, Ernst Daniel, 3,926,299.

Parbel, Horst: *See—*
Birtigh, Gerhard; Parbel, Horst; and Sauer, Heinrich, 3,926,565.

Park-Ohio Industries Inc.: *See—*
Konas, William W.; Day, Paul L.; and Budzinski, Roger R., 3,926,415.

Parker, Frank S., to Newcor, Inc. Diode stack with segmented mounting plate. 3,927,355, Cl. 317-100.000.

Parker-Hannifin Corporation: *See—*
Hoffman, Robert K., 3,926,280.
Hoffman, Robert Kendall, 3,926,208.

Parker, Sidney A.; and Rothstein, Seymour, to Lennox Industries Inc. Hermetic compressor with insulated discharge tube. 3,926,009, Cl. 62-296.000.

Parkins, Derek Ray, to SKF Industrial Trading and Development Company B.V. Spindle and bearing assemblies. 3,926,484, Cl. 308-174.000.

Parks-Cramer (Great Britain), Ltd.: *See—*
Harrap, John; and Stewart, Richard Gordon, 3,926,665.

Passal, Frank, to M&T Chemicals Inc. Tin-lead alloy plating. 3,926,749, Cl. 204-43.00S.

Patashnick, Harvey, to Rupprecht, Georg, a part interest. Microbalance. 3,926,271, Cl. 177-210.000.

Patel, Girish: *See—*
Keegan, James J.; Patel, Girish; and Rubin, Howard, 3,926,870.

Paterson, James G. T.: *See—*
O'Mahony, Gerard M.; and Paterson, James G. T., 3,926,547.

Paul, Jurgen; Kostelezky, Walter; and Schwerdt, Paul, to Daimler-Benz Aktiengesellschaft. Frequency transmitters for producing control signals controlling the brake force in motor vehicle wheels. 3,927,339, Cl. 310-155.000.

Pauls, Joachim: *See—*
Scholl, Gunter; and Pauls, Joachim, 3,927,248.

Paulson, Gary L., to Hewlett-Packard Company. Differential drive rotating disc impact printer. 3,926,061, Cl. 74-22.00R.

Pawloski, Chester E., to Dow Chemical Company, The. Substituted pyridine phosphonothioates. 3,927,004, Cl. 260-294.80K.

Peabody Galion Corporation: *See—*
Walker, James Donald, 3,926,805.

Pearce, George W. Controlled spraying. 3,926,369, Cl. 239-1.000.

Pearce, Peter J., to Synestructics, Inc. Modular curved surface space structures. 3,925,941, Cl. 52-82.000.

Pearse, James N., to Appleton Electric Company. Explosion proof plastic electrical enclosure. 3,927,249, Cl. 174-51.000.

Pearson, John L.: *See—*
Teuber, Roland E.; Pearson, John L.; and Brown, Charles D., 3,926,390.

Peat, Derek: *See—*
Hodson, David George; and Peat, Derek, 3,927,356.

Peck, Reese A.: *See—*
Wilson, Raymond F.; Peck, Reese A.; Estes, John H.; and Brandenburg, John T., 3,926,779.

Peed, James L.: *See—*
Atkinson, Lester M.; Bigham, Carroll R.; and Peed, James L., 3,925,956.

Pei, Yu K., to Owens-Illinois, Inc. Recuperator structures. 3,926,251, Cl. 165-165.000.

Pelezo, Chris A.: *See—*
Dobinson, Frank; and Pelezo, Chris A., 3,926,887.

Pelin, Charles. Dashboard-mounted automatic route information display device. 3,925,918, Cl. 40-42.000.

Pellett, Fred G., to Owens-Illinois, Inc. Method for refining molten glass-making materials. 3,926,607, Cl. 65-136.000.

Pembrook, John D.; Burch, Darrell E.; and Gates, Francis J., to Philco-Ford Corporation. Rotating gas correlation cell. 3,926,527, Cl. 356-246.000.

Pendry, Hudson G., to Raymond Lee Organization Inc., The, a part interest. Aluminum holding furnace. 3,926,416, Cl. 266-33.00R.

Penner, Siegfried E.: *See—*
Beard, William Q., Jr.; Moyer, Patricia H.; and Penner, Siegfried E., 3,926,847.

Pennington, William; and Pennington, William, III. Frameless safety water bed. 3,925,835, Cl. 5-348.0WB.

Pennington, William, III: *See—*
Pennington, William; and Pennington, William, III, 3,925,835.

Pennwalt Corporation: *See—*
Fox, Adrian Samuel, 3,927,072.
Haszeldine, Robert Neville; and Rowland, Ronald, 3,927,129.

Perkin-Elmer Corporation, The: *See—*
Rayces, Juan L., 3,926,505.

Perkins, Roger S. Safety panel for bathtubs. 3,925,831, Cl. 4-183.000.

Perkins, Thomas K., to Atlantic Richfield Company. Method for normalizing stresses and strains in a well casing in a permafrost zone. 3,926,259, Cl. 166-302.000.

Perla, Giulio; and Mattiello, Giuseppe, to Colgate-Palmolive Company. Method for producing detergent cakes. 3,926,863, Cl. 252-557.000.

Pero, Donald E.: *See—*
Nadasi, Laszlo; Nadasi, Marton; Zelenko, John; and Pero, Donald E., 3,926,471.

Pershin, Grigory Nikolaevich: *See—*
Grinev, Alexei Nikolaevich; Shvedov, Vasily Ivanovich; Sytina, Evgenia Nikolaevna; Bogdanova, Nadezhda Sergeevna; Nikolaeva, Irina Sergeevna; Pershin, Grigory Nikolaevich; and Guskova, Tatyana Anatolievna, 3,927,125.

Pershing, Robert G.: *See—*
Gupta, Shanti S.; and Pershing, Robert G., 3,927,280.

Peter, Richard; and Angliker, Hansjoerg, to Ciba-Geigy AG. Water-insoluble styryl dyestuffs. 3,927,063, Cl. 260-465.00D.

Peters, Werner: *See—*
Schmalfeld, Paul; Sauter, Dieter; Peters, Werner; Ahland, Erwin; Bock, Burkhard; and Lehmann, Joachim, 3,926,576.

Petersen, Christian C., to Polaroid Corporation. Electromagnetically regulated exposure control system. 3,927,415, Cl. 354-230.000.

Peterson, Carl R., to Rapidex, Inc. Impact actuator. 3,925,985, Cl. 60-371.000.

Peterson, Christian M.: *See—*
Pierce, Allan A.; Peterson, Christian M.; and Kunde, Jerry G., 3,926,425.

Peterson, Edward M.: *See—*
Evankovich, Peter P.; Madden, Robert J.; and Peterson, Edward M., 3,926,241.

Peterson, Francis C., to C. Hager & Sons Hinge Manufacturing Company. Locking device for doors. 3,926,460, Cl. 292-144.000.

Peterson, Robert A., to Raytheon Company. Reduced speed compensator for microwave heating applicator. 3,927,291, Cl. 219-10.55R.

Petersons, Aivars V.; and Brewer, Howell K. Studded replaceable tread tire. 3,926,239, Cl. 152-210.000.

Petrie, John David. Portable structural framing member. 3,925,943, Cl. 52-108.000.

Petrolite Corporation: *See—*
Quinlan, Patrick M., 3,926,801.
Watson, Frederick D.; and Winslow, Joseph D., Jr., 3,926,774.
Zetlmeisl, Michael J.; May, Walter R.; and Annand, Robert R., 3,926,577.

Petronchak, John: *See—*
Herron, William; Adams, Kenneth D.; and Petronchak, John, 3,926,133.

Petty, John Lee; and Amano, George Minoru, to Sherwin-Williams Company, The. Water reducible paint composition containing aluminum metal or the like. 3,926,874, Cl. 260-22.00A.

Petzetakis, Aristovoulos George. Large diameter hollow bodies of helical thermoplastic strip. 3,926,223, Cl. 138-129.000.

Petzke, Jeffrey C.; and Bahr, Dennis E., to Wisconsin Alumni Research Foundation. Blood pressure measuring apparatus. 3,926,179, Cl. 128-2.05N.

Peychev, Lyubomir Dimov: *See—*
Pissarev, Angel Nikolaev; Miteva, Maria Pancheva; Balabanov, Ivan Velev; and Peychev, Lyubomir Dimov, 3,926,495.

Pfaender, Lawrence V.: *See—*
Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V., 3,927,342.

Pfizer Inc.: *See—*
Barth, Wayne E., 3,927,214.
Barth, Wayne E., 3,927,215.
Kuhla, Donald E., 3,926,991.
Lombardino, Joseph G., 3,927,002.
McFarland, James W., 3,926,992.
Monkhouse, Donald C., 3,927,197.

Philco-Ford Corporation: *See—*
Pembrook, John D.; Burch, Darrell E.; and Gates, Francis J., 3,926,527.

Philip Morris Inc.: *See—*
Devilbiss, Roy J., 3,925,891.

Philipp, Lee D.: *See—*
Billeter, Thomas R.; and Philipp, Lee D., 3,927,369.

Phillippi, Conrad M.; Stevison, Donald F.; and Ekman, Willard J. Device for measuring laser beam penetration time. 3,926,034, Cl. 73-15.00R.

Phillips Petroleum Company: *See—*
Anderson, John E., 3,926,742.
Cichowski, Robert S., 3,926,845.
Hessert, James E.; and Johnston, Chester C., Jr., 3,926,258.
Kenton, Joseph R., 3,926,610.
Naylor, Floyd E., 3,926,933.
Walker, Darrell W., 3,927,138.

Phillips, Wayne M.: *See—*
United States of America, National Aeronautics and Space Administration; and Phillips, Wayne M., 3,926,567.

Phoenix Valve Manufacturers Limited: *See—*
MacLarty, Bernard Graham, 3,926,211.

Piccolo, Luigi; and Paolinelli, Antonio, to Societa' Italiana Resine S.I.R. S.p.A. Compositions for soil improvement and process for their production. 3,926,708, Cl. 71-1.000.

Pickel, Robert Paul, to Conrad Pickel Studios, Inc. Niches. 3,925,944, Cl. 52-134.000.

Pierce, Allan A.; Peterson, Christian M.; and Kunde, Jerry G., to Kimberly-Clark Corporation. Method of coupon positioning and mechanism therefor. 3,926,425, Cl. 270-83.000.

Pierce Pacific Mfg. Inc.: *See—*
Leslie, Craig A., 3,926,453.

Pike, John E.; and Schneider, William P., to Upjohn Company, The. PGF_{2_α} and PGF_{2_α}, 15-acetate, methyl esters. 3,927,075, Cl. 260-488.00R.

Pilgram, Kurt H. G.; Jackson, Earl K.; and Kollmeyer, Willy D., to Shell Oil Company. Plant growth regulators. 3,927,062, Cl. 260-456.0NS.

Pilkington Brothers Limited: *See—*
Charlesworth, Donald, 3,926,606.

Pimbley, Walter T., to International Business Machines Corporation. Ink jet nozzle. 3,927,410, Cl. 346-140.000.

Pioneer Electronic Corporation: *See—*
Hibi, Tadatoshi; and Okura, Keniti, 3,926,441.

Piper, James. Air blower. 3,926,537, Cl. 417-353.000.

Pissarev, Angel Nikolaev; Miteva, Maria Pancheva; Balabanov, Ivan Velev; and Peychev, Lyubomir Dimov, to DSO "ELPROM". Electrical contact body. 3,926,495, Cl. 339-48.000.

Pitic, Jean-Marc B.: *See—*
Voyer, Paul; Pitic, Jean-Marc B.; Louvet, Olivier F.; and Roche, Alain Y., 3,927,267.

Pitney-Bowes, Inc.: *See—*
Hubbard, David W.; and Kittredge, Lloyd G., 3,926,110.

Pitt Metals and Chemicals, Inc.: *See—*
Horn, Richard E.; and Grenda, David W., 3,926,759.

Pitts, David E., to United States of America, General Counsel-Code GP. Method for manufacturing mirrors in zero gravity environment. 3,927,227, Cl. 427-162.000.

Plank, Charles J.; Rosinski, Edward J.; and Schwartz, Albert B., to Mobil Oil Corporation. Hydrocarbon conversion. 3,926,782, Cl. 208-135.000.

Plasser, Erna, heir: *See—*
Plasser, Franz, deceased; Plasser, Erna, heir; Theurer, Josef; Schubert, Egon; and Riessberger, Klaus, 3,926,123.

Plasser, Franz, deceased; by Plasser, Erna, heir; Theurer, Josef; Schubert, Egon; and Riessberger, Klaus. Track surfacing apparatus. 3,926,123, Cl. 104-7.00R.

Plessey Handel und Investments A.G.: *See—*
Wren, John Pelham, 3,926,440.

Plesslinger, Gertraud Agnes Anna; Berthold, Frank; and Roeder, Erwin, to U.S. Philips Corporation. Method of manufacturing a glass ceramic material which is resistant to sodium vapour. 3,926,603, Cl. 65-33.000.

Plonsker, Larry, to Ethyl Corporation. Fuel compositions and additive mixtures for reducing the plugging of exhaust gas catalysts. 3,926,581, Cl. 44-68.000.

Plummer, Walter A.: *See—*
Plummer, Walter A., III, 3,925,856.

Plummer, Walter A., III, to Plummer, Walter A. Self locking seam forming members. 3,925,856, Cl. 24-201.00C.

Poche, John M. Floating oil fence. 3,925,991, Cl. 61-1.00F.

Poetsch, Eike, to Merck Patent Gesellschaft Mit Beschraenkter Haftung. 4-(Phenyl)-piperazino halo alkenones and alkanones. 3,926,999, Cl. 260-268.0PH.

Poinsard, Henri; and Lemoing, Jean, to Thomson-CSF. System for processing the signal received by a sideways looking airborne radar system. 3,927,405, Cl. 343-5.0CM.

Polaroid Corporation: *See—*
Baron, Richard C.; Cerankowski, Leon D.; and Mattucci, Neil, 3,926,922.
Borror, Alan L.; Hill, Ruth Linda; and Garcia, Paulina P., 3,926,971.
Ellin, Seymour, 3,927,412.
Franklin, David M.; and Lane, William P., 3,927,367.
Petersen, Christian C., 3,927,415.

Polic, Edward F.: *See—*
Frank, Edmund; and Polic, Edward F., 3,926,323.

Politechnika Gdanska: *See—*
Zielonko, Romuald; Hoja, Jerzy; and Wojciechowski, Henryk, 3,927,368.

Pollet, Robert Joseph: *See—*
Hofman, Emiel Alexander; Berendsen, Jules Robert; and Pollet, Robert Joseph, 3,926,632.

Polley, Eugene J., to Zenith Radio Corporation. Biased video disc stabilizer system. 3,927,252, Cl. 179-6.70R.

Pollkotter, Gunter: *See—*
Schroder, Paul B.; and Pollkotter, Gunter, 3,926,025.

Polysius AG: *See—*
Heinemann, Otto, 3,925,907.

Pomeranz, Jehoshua Naphtali; and Schnurmann, Henri Daniel, to International Business Machines Corporation. Test system for large scale integrated circuits. 3,927,371, Cl. 324-73.00R.

Pommerening, Uwe A.; and Richards, Glenn L., to Stromberg-Carlson Corporation. Junctor memory. 3,927,273, Cl. 179-18.00J.

Pontigny, Jacques. Dilatable tube, method for its production and applications thereof. 3,926,459, Cl. 285-381.000.

Popov, Vasily Dmitrievich: *See—*
Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovidh; Zakharova, Nina Vasilievna; Golubenko, Mikhail Afanasievich; Tolstikov, Genrikh Alexandrovich; Kholodovskaya, Rakhil Samoilovna; Shalimova, Zoya Stepanovna; Legostaeva, Taisia Vasilievna; Popov, Vasily Dmitrievich; and Dolidze, Vladimir Romanovich, 3,927,038.

Port, Eugene B.: *See—*
Garofano, Norman R.; and Port, Eugene B., 3,927,175.

Porter, Allan William Henry, to Aktiengesellschaft Adolph Saurer. Guide member support and device for beating up weft yarn in the shed of a loom. 3,926,226, Cl. 139-190.000.

Portnoy, Norman A.: *See—*
Reine, Alden H.; Arthur, Jett C., Jr.; and Portnoy, Norman A., 3,926,555.

Pottage, Paul Richmond: *See—*
Rundell, John Trethowan; and Pottage, Paul Richmond, 3,926,662.

Potter, Sheila Antoinette, to Imperial Chemical Industries Limited. Process for manufacture of bipyridyls. 3,927,009, Cl. 260-296.00D.

Pottier, Michel: *See—*
Senes, Michel; Lhonore, Pierre; Pottier, Michel; and Quibel, Jacques, 3,926,853.

Potts, Thomas James: *See—*
Johnson, Reginald Francis; Potts, Thomas James; and Jennings, Gordon Bridgman, 3,926,079.

Pouch, Thomas M.; and Ladouceur, Harold A., to Multifastener Corporation. Self-fastening nut, panel assembly and apparatus. 3,926,236, Cl. 151-41.730.

Powell, James Basil. Process for making nitric acid by the ammonia oxidation-nitric oxide oxidation-water absorption method. 3,927,182, Cl. 423-392.000.

Powell, Orlo A., Jr.; and Roncari, Angelo J., to Urban Research & Development Corporation. Method and apparatus for pyrolytic treatment of solid waste materials. 3,926,582, Cl. 48-62.000.

Powell, Richard E.; and Starck, Robert W., to Sheller-Globe Corporation. Process for manufacturing foam padded skinned arm rests and crash pads. 3,927,161, Cl. 264-46.600.

Powers, Walter H.: *See—*
Frost, Louis H.; and Powers, Walter H., 3,927,285.

PPG Industries, Inc.: *See—*
Hoekje, Howard H., 3,926,770.
Kunkle, Gerald E., 3,926,605.

Prager, Hans John: *See—*
Kawamoto, Hirohisa; Prager, Hans John; and Risko, John Joseph, 3,926,693.

Prahl, Franz: *See—*
Preller, Fritz; and Prahl, Franz, 3,926,285.

Prater, Earle F., to Roberts Consolidated Industries, Inc. Carpet seaming iron. 3,927,298, Cl. 219-245.000.

Pratt, George W., Jr., to Massachusetts Institute of Technology. Light emitting diode. 3,927,385, Cl. 331-94.50H.

Precisa AG Rechenmaschinenfabrik: *See—*
Meier, Johann, 3,926,270.

Precision Screw & Manufacturing Company Limited, The: *See—*
Still, Leslie Ernest, 3,926,356.

Preller, Fritz; and Prahl, Franz, to Knorr-Bremse GmbH. Mounting device for a brake disk. 3,926,285, Cl. 188-218.0XL.

Preload Technology, Inc.: *See—*
Closner, John J.; Marchaj, Tadeusz Josef; and Wichman, Sven Hjalmar, 3,926,134.

Preston, Jack, to Monsanto Company. Aromatic polyester-amides. 3,926,923, Cl. 260-78.00R.

Preuss, Friedrich, to Roland Offsetmaschinenfabrik Faber & Schleicher. Rotary printing press impression cylinder having clamping and sheet gripping devices. 3,926,118, Cl. 101-246.000.

Priceman, Seymour, to DeWiant Corporation. Molybdenum based substrate coated with homogeneous molybdenum trialuminide. 3,926,574, Cl. 29-197.000.

Pridonoff, Eric L.: *See—*
Stary, Marvin L.; Brown, Edward L.; and Pridonoff, Eric L., 3,926,230.

Priem, Jan Jozef: *See—*
Monbaliu, Marcel Jacob; Priem, Jan Jozef; and Vrydaghs, Roger Henri, 3,926,436.

Primus, Frederick James: *See—*
Hansen, Hans John; and Primus, Frederick James, 3,927,193.

Prince Corporation: *See—*
Marcus, Konrad H., 3,926,470.

Prino, Giuseppe: *See—*
Butti, Adriano; and Prino, Giuseppe, 3,926,921.

Pro-Tech Inc.: *See—*
McClure, Charles Laird, 3,926,804.

Procter & Gamble Company, The: *See—*
Bates, Gregory A., 3,926,716.

Prvni Brnenska strojirna: *See—*
Stloukal, Mojmir; Syrovatka, Zdenek; Dolezel, Milan; and Stripek, Karel, 3,926,130.

Pryor, David Ernest: *See—*
Forsyth, Bruce Adam; and Pryor, David Ernest, 3,927,071.

Puchta, Herbert: *See—*
Jantzen, Hermann; Kuffel, Karl; and Puchta, Herbert, 3,926,068.

Pugh, Cecil C.: *See—*
Braden, Ralph S.; Pugh, Cecil C.; and Rigg, Ralph R., 3,926,007.

Pulk, Elgas, deceased; by Hallsenius, Carlgustaf, Administrator; and Noren, John Paul, to Stabilator AB. Device for the batching of media. 3,926,345, Cl. 222-145.000.

Pulker, Hans K., to Balzers Patent-und Beteiligungs-Aktiengesellschaft. Method of depositing titanium dioxide layers by evaporation of a molten titantium-oxygen phase. 3,927,228, Cl. 427-162.000.

Pullman Incorporated: *See—*
Deller, Robert J., 3,926,530.

Puskas, Imre: *See—*
Cengel, John A.; and Puskas, Imre, 3,927,041.

Pustelnik, Roy J., to J. I. Case Company. Turbocharger exhaust gas recirculation system. 3,925,989, Cl. 60-602.000.

Quade, Robert T.: *See—*
Greenberg, Jonathan Fred; and Quade, Robert T., 3,926,194.

Quaker Oats Company, The: *See—*
Bozer, Keith B.; and Brown, Lloyd H., 3,927,139.
Gilbert, Eugene C.; Jones, Robert E.; McLean, Donald C.; and Sherman, Edward, 3,927,106.

Quentin, Jean-Pierre: *See—*
Gigou, Claude; and Quentin, Jean-Pierre, 3,926,797.

Quibel, Jacques: *See—*
Senes, Michel; Lhonore, Pierre; Pottier, Michel; and Quibel, Jacques, 3,926,853.

Quinlan, Patrick M., to Petrolite Corporation. Methylene phosphonates of glycidyl reacted polyalkylene polyamines and use in scale and chelation. 3,926,801, Cl. 210-58.000.

Quiring, Bernd: *See—*
Golitz, Hans Dietrich, deceased; Wagner, Kuno; Quiring, Bernd; and Noll, Walter, 3,927,042.

Quock, Billy; Kelley, Don Howard; Warneke, Sehon Lester; and Gurgiolo, Arthur E., to Dow Chemical Company, The. High resiliency flexible urethane foams. 3,926,867, Cl. 260-2.5AM.

R. A. Pearson Company: *See—*
Graham, Robert H.; and Sanders, Duane, 3,926,336.

Raab, Richard, to Diehl. Device for use in connection with metal extrusion presses along a press path. 3,926,022, Cl. 72-24.000.

Rademachers, Jakob: *See—*
Lailach, Gunter; and Rademachers, Jakob, 3,926,615.

Radiometer A/S: *See—*
Ruzicka, Jaromir; and Lamm, Carl Goran, 3,926,764.

Radtke, Volker: *See—*
Dimroth, Peter; and Radtke, Volker, 3,926,987.

Raffensparger, John H: Counter system for step-and-repeat drafting arm. 3,925,900, Cl. 33-81.000.

Rahlfs, Herbert: *See—*
Reifenhauser, Fritz; and Rahlfs, Herbert, 3,926,706.

Rainger, Peter, to British Broadcasting Corporation. Television system with transmission of auxiliary information. 3,927,250, Cl. 178-5.600.

Rall, Ulrich; Mahall, Karl; and Kuper, Wilfried, to Henkel & Cie GmbH. Method for the production of porous webs with a leather-like grain. 3,927,229, Cl. 427-171.000.

Ram Meter, Inc.: *See—*
Zawadski, Andrzej, 3,927,348.

Ramsden, Paul S., Jr., to Centronics Data Computer Corporation. Format control technique and apparatus therefor. 3,926,292, Cl. 197-1.00R.

Ramsteck, Wolfgang, to Lenser Verwaltungs-GmbH. Filter-plate assembly for filter press. 3,926,811, Cl. 210-231.000.

Randour, Victor: *See—*
Blomstrom, Gary D.; Randour, Victor; and York, Lyle E., 3,926,273.

Rank Organisation Ltd., The: *See—*
Jungles, John; Whitehouse, David John; and Nightingale, Eric Gordon, 3,927,253.

Rapidex, Inc.: *See—*
Peterson, Carl R., 3,925,985.

Rarey, Charles R.: *See—*
Aronson, Arthur H.; and Rarey, Charles R., 3,926,624.

Rasmussen, Ivar, to Danfoss A/S. Valve combination for hydraulic systems. 3,926,210, Cl. 137-491.000.

Rathjen, Hans-Carl: *See—*
Koziol, Konrad; Rathjen, Hans-Carl; and Sieberer, Karl-Heinz, 3,926,773.

Ratto, Joseph J.: *See—*
Jones, Freeman B., Jr.; and Ratto, Joseph J., 3,926,834.

Ratz, Heinz: *See—*
Klunsch, Maximilian; Lingens, Paul; and Ratz, Heinz, 3,926,696.

Rauenbusch, Erich: *See—*
Huper, Fritz; and Rauenbusch, Erich, 3,926,730.

Raveschot, Marcel R.: *See—*
Ladd, Floyd N.; Raveschot, Marcel R.; and Stacy, Donald G., 3,926,066.

Rawcliffe, Gordon Hindle: *See—*
Broadway, Alexander Richard William; Fong, William; and Rawcliffe, Gordon Hindle, 3,927,358.

Ray-Chaudhuri, Dilip K.: *See—*
Georgoudis, Paul C.; Ray-Chaudhuri, Dilip K.; and Flanagan, Thomas P., 3,926,920.

Ray, Neil Hunter; Laycock, John Nicholas Clayton; and Robinson, William Derek, to Imperial Chemical Industries Limited. Borosphosphate glass compositions with high water resistance and low softening point. 3,926,649, Cl. 106-47.00R.

Rayces, Juan L., to Perkin-Elmer Corporation, The. All spherical solid catadioptric systems. 3,926,505, Cl. 350-201.000.

Raychem Corporation: *See—*
Naidoff, Robert J., 3,927,233.

Raymond, Edwin S. Sheet metal securing device. 3,926,420, Cl. 269-47.000.

Raymond Lee Organization, Inc., The: *See—*
Falzone, John, 3,925,832.
Hilderbrand, Henry R., 3,926,361.
Pendry, Hudson G., 3,926,416.

Raytheon Company: *See—*
Labossier, William H.; and Schilling, Hartmut, 3,926,571.
Peterson, Robert A., 3,927,291.
Saponara, Domenick, 3,926,172.

Razoutz, Michel: *See—*
Michelet, Daniel; and Razoutz, Michel, 3,927,045.

RBP Chemical Corporation: *See*—
Dixon, Charles H., 3,926,699.
RCA Corporation: *See*—
Bartolini, Robert Alfred; and Bloom, Allen, 3,926,637.
Ferrie, Ronald Gilbert, 3,927,376.
Fjarlie, Earl John; Doyle, Thomas; and Teare, Melvin John, 3,927,383.
Hughes, Richard Henry, 3,927,341.
Kawamoto, Hirohisa; Prager, Hans John; and Risko, John Joseph, 3,926,693.
McKeon, Edward Francis Thomas; and Martin, Michael Ray, 3,927,332.
White, Hugh Edward; and Lippman, Michael David, 3,927,251.
Yorkanis, Bernard Joseph, 3,927,255.
Reactor Centrum Nederland (Stichting): *See*—
van Beijnen, Christianus Antonius Maria, 3,926,683.
Reade, Richard F., to Corning Glass Works. Transparent, crystalline, cathodoluminescent materials. 3,926,838, Cl. 252-301.40F.
Reade, Richard F.: *See*—
Andrus, Ronald L.; and Reade, Richard F., 3,926,602.
Rebres, Robert P., to Xerox Corporation. Control device for an electrophotographic printing machine. 3,926,519, Cl. 355-14.000.
Rebsdat, Siegfried; and Hahn, Helmut, to Hoechst Aktiengesellschaft. Process for the preparation of aryl-1,1,2,2-tetrafluoroethyl ethers. 3,926,989, Cl. 260-247.70C.
Recherche et Industrie Therapeutiques: *See*—
Lhoest, Willy, 3,926,341.
Recherche et Industrie Therapeutiques (R.I.T.): *See*—
Zygraich, Nathan; and Huygelen, Constant, 3,927,208.
Recon Corporation: *See*—
Buford, J. Philip, 3,926,792.
Reddy, Junuthula N., to Bendix Corporation, The. Closed throttle tip-in circuit. 3,926,153, Cl. 123-32.0EA.
Redman Fisher Engineering Limited: *See*—
Orwin, Olaf John Barclay, 3,926,125.
Reeder, Wilbur C.; and Batterson, Norman D. Method for irrigating terrain. 3,926,374, Cl. 239-1.000.
Reeder, Wilbur C.; and Batterson, Norman D. Weeper irrigation device. 3,926,375, Cl. 239-542.000.
Reell Precision Manufacturing Corporation: *See*—
Johnson, Lee W., 3,926,286.
Reese, Cecil E., to Du Pont de Nemours, E. I., and Company. Production of mixed shrinkage polyester yarn. 3,927,167, Cl. 264-210.00F.
Regents of the University of Colorado: *See*—
Sodal, Ingvar E.; Hoivik, Lars; Micco, Alexander J.; Weil, John V.; and Baer, Norman W., 3,926,209.
Regie Nationale Des Usines Renault: *See*—
Forichon, Gaston, 3,926,033.
Roche, Jean Claude; Lavarec, Martial; and Maurice, Jean, 3,926,073.
Reichard, Kenneth. Golf cart pulling apparatus. 3,926,448, Cl. 280-1.500.
Reid, John S.; and Hayes, Christopher W. J. Protective device and method for use with audio amplification equipment. 3,927,353, Cl. 317-40.00A.
Reifenhauser, Fritz; and Rahlfs, Herbert, to Reifenhauser KG. Film blowing method. 3,926,706, Cl. 156-229.000.
Reifenhauser KG: *See*—
Reifenhauser, Fritz; and Rahlfs, Herbert, 3,926,706.
Reiger, Arthur C., Jr.; and Finegold, Hyman B., to Globe Tool and Engineering Company, The. Turret for workpiece. 3,926,421, Cl. 269-57.000.
Reil, Wilhelm, to Altstadter Verpackungs-Vertriebs GmbH. Sealing jaw. 3,927,297, Cl. 219-243.000.
Reine, Alden H.; Arthur, Jett C., Jr.; and Portnoy, Norman A., to United States of America, Agriculture. Modification of cotton textiles and cotton/polyester textile blends by photo-initiated polymerization of vinylic monomers. 3,926,555, Cl. 8-189.000.
Reinhardt, Konrad: *See*—
Gudernatsch, Hugo; Jaekel, Gerhart; Kroll, Wolfgang; Oden, Volker; and Reinhardt, Konrad, 3,926,810.
Reinwall, Ernest William, Jr.: *See*—
Hagel, John Louis; Pape, Robert Carl; and Reinwall, Ernest William, Jr., 3,925,952.
Reisman, Arnold, to International Business Machines Corporation. Method for fabricating a gas discharge panel structure. 3,926,763, Cl. 204-192.000.
Reiter, Ralph H.: *See*—
Rosen, George; Carlick, Daniel J.; and Reiter, Ralph H., 3,926,638.
Rosen, George; Carlick, Daniel J.; and Reiter, Ralph H., 3,926,639.
Reliance Brooks, Inc.: *See*—
Geen, Wesley C., 3,926,368.
Rembaum, Alan; and Yen, Shiao-Ping Siao, to California Institute of Technology. Substrate coated with a layer of polyquaternary polyelectrolytes. 3,927,242, Cl. 428-411.000.
Renata A.G.: *See*—
Uebelhart, Heinrich; Schmid, Erich; and Wyser, Paul, 3,926,048.
Renfro, Julian C.: *See*—
Camp, Lionel S., 3,926,167.
Reschak, Robert J., to Textron Inc. Power available indicator. 3,927,307, Cl. 235-151.300.
Research Corporation: *See*—
Babler, James H., 3,927,076.
Rice, James T.; and Chen, Chia M., 3,927,140.
Research Homes, Inc.: *See*—
Molen, Ronald L., 3,925,938.
Respen, Yves Jean; Cosse, Paul Andre; and Economopoulos, Mario, to Centre de Recherches Metallurgiques - Centrum voor Research in de Metallurgie. Method of producing hot rolled steel rods or bars. 3,926,689, Cl. 148-12.400.
Restaino, Alfred J., to Hercules Incorporated. Process for preparing high molecular-weight, water soluble vinyl polymers by irradiation. 3,926,756, Cl. 204-159.220.
Reudink, Douglas Otto John: *See*—
Cox, Donald Clyde; Langseth, Rollin Edward; Reudink, Douglas Otto John; and Rustako, Anthony Joseph, Jr., 3,927,379.
Reuter, Manfred, to Georg Spellmann Hannov.-Holz-Industrie. Structural members for mounting and guiding sliding doors. 3,925,933, Cl. 49-409.000.
Reuter, Martin; and Beermann, Claus, to Hoechst Aktiengesellschaft. Process for the preparation of bis-hydroxymethyl-methylphosphine. 3,927,112, Cl. 260-606.50P.
Reuter, Martin; and Rupp, Walter, to Hoechst Aktiengesellschaft. Process for the preparation of methylphosphine oxides. 3,927,113, Cl. 260-606.50P.
Revill, Charles L.: *See*—
Stephens, Galen H.; and Revill, Charles L., 3,926,788.
Reyes, Daniel. Stereophonic cabinet. 3,926,487, Cl. 312-223.000.
Reyner, Noel L., to Xerox Corporation. Thermally insensitive particle concentration controller. 3,926,338, Cl. 222-56.000.
Reynolds Metals Company: *See*—
Dooley, Milton T., 3,927,337.
Rheinische Kalksteinwerke GmbH: *See*—
Wuhrer, Josef, 3,926,647.
Rheinwald, James G.: *See*—
Green, Howard; and Rheinwald, James G., 3,926,723.
Rhone-Poulenc: *See*—
Michelet, Daniel; and Razoutz, Michel, 3,927,045.
Rhone-Poulenc, S.A.: *See*—
Bouchaudon, Jean; Le Roy, Pierre; and Messer, Mayer Naoum, 3,926,956.
Bourdin, Francois; Chizat, Francois; Costantini, Michel; and Joufret, Michel, 3,927,122.
Bourdin, Francois; Chizat, Francois; Costantini, Michel; and Joufret, Michel, 3,927,123.
Brunie, Jean-Claude; and Crenne, Noel, 3,927,105.
Desitter, Gerard; and Vivant, Gilbert, 3,927,231.
Dumoulin, Jean, 3,926,896.
Gigou, Claude; and Quentin, Jean-Pierre, 3,926,797.
Le Ludec, Joel, 3,927,101.
Rhone-Poulenc-Textile: *See*—
Morf, Jacques, 3,926,535.
Ribeyre, Jean-Paul; and Marty, Claude, to Schlumberger Technology Corporation. Line cutting devices. 3,926,252, Cl. 166-54.600.
Ricards, Charles R.: *See*—
Merker, George; Krupp, Joseph; Ricards, Charles R.; and Ward, Thomas A., 3,926,423.
Rice, James T.; and Chen, Chia M., to Research Corporation. Adhesive composition. 3,927,140, Cl. 260-838.000.
Richards, Glenn L.: *See*—
Pommerening, Uwe A.; and Richards, Glenn L., 3,927,273.
Richards, Raymond S.: *See*—
Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V., 3,927,342.
Richards, William; and Grolman, Bernard, to American Optical Corporation. Supporting system for artificial intraocular lens. 3,925,825, Cl. 3-13.000.
Richardson, Donald M.: *See*—
Bamberger, Carlos E.; and Richardson, Donald M., 3,927,192.
Richardson, Walter Lorne, to Northern Eelectric Company Limited,. Planetary differential transmission. 3,926,072, Cl. 74-665.00N.
Rick, Edward A.; and Tinsley, Samuel W., to Union Carbide Corporation. Bicyclo[2.2.1] Hept-5(6)-yl compounds. 3,927,116, Cl. 260-611.00F.
Ricklefs, Robert U. Abrading system. 3,925,935, Cl. 51-8.0HD.
Ricoh Co., Ltd.: *See*—
Fujimoto, Sakae, 3,927,256.
Nagahara, Yasumori, 3,926,515.
Nagahara, Yasumori, 3,926,517.
Satomi, Toyokazu; Nagahara, Yasumori; and Narita, Teruo, 3,926,429.
Ridyard, Denis Robert Annesley, to Imperial Chemical Industries Limited. Water soluble monoazo dyestuffs containing a diphenylamine group carrying a sulphamoyl substituent and a sulpho or sulphato substituent. 3,926,946, Cl. 260-206.000.
Riegel Textile Corporation: *See*—
Brocklehurst, Charles E., 3,926,334.
Riegler, Ernst; and Schmidt, Manfred, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Bearing construction for heavy machines, in particular for steel works converters. 3,926,481, Cl. 308-6.00R.
Riemath, William Frederic: *See*—
Hungate, Frank Porter; Riemath, William Frederic; and Bunnell, Lee Roy, 3,927,325.
Riessberger, Klaus: *See*—
Plasser, Franz, deceased; Plasser, Erna, heir; Theurer, Josef; Schubert, Egon; and Riessberger, Klaus, 3,926,123.
Rigg, Ralph R.: *See*—
Braden, Ralph S.; Pugh, Cecil C.; and Rigg, Ralph R., 3,926,007.

Riker Laboratories, Inc.: *See—*
Scherrer, Robert A., 3,927,037.
Rion Kabushiki Kaisha: *See—*
Nakamura, Kenji; Fukuyama, Kunihiko; and Yamamoto, Takuo, 3,927,279.
Risko, John Joseph: *See—*
Kawamoto, Hirohisa; Prager, Hans John; and Risko, John Joseph, 3,926,693.
Rival Manufacturing Company: *See—*
McLean, Robert E., 3,925,887.
Rixson-Firemark, Inc.: *See—*
D'Hooge, Richard E., 3,926,461.
Robert Bosch Fernsehanlagen GmbH: *See—*
Spannhake, Dieter, 3,927,346.
Robert, Lawrence A.: *See—*
Deitch, James C.; and Robert, Lawrence A., 3,927,275.
Roberts Consolidated Industries, Inc.: *See—*
Prater, Earle F., 3,927,298.
Roberts, Stiles M.; and Stanley, Lester N., to GAF Corporation. 2,4-Dicyano butylamino-substituted monoazo dyestuffs. 3,926,945, Cl. 260-205.000.
Roberts, Verne W. Back gauge warning system for shears and the like. 3,926,081, Cl. 83-96.000.
Robins, Lenford L. Dual purpose tooth aligner. 3,925,894, Cl. 32-14.00B.
Robins, Roland K.: *See—*
Witkowski, Joseph T.; and Robins, Roland K., 3,927,216.
Robinson, James V., to Mead Corporation, The. Production of carbonyl compounds. 3,927,111, Cl. 260-604.0AC.
Robinson, William Derek: *See—*
Ray, Neil Hunter; Laycock, John Nicholas Clayton; and Robinson, William Derek, 3,926,649.
Roblin Hope's Industries, Inc.: *See—*
Sauer, Gale E.; and Hansen, Barton G., 3,925,948.
Roche, Alain Y.: *See—*
Voyer, Paul; Pitie, Jean-Marc B.; Louvet, Olivier F.; and Roche, Alain Y., 3,927,267.
Roche, Jean Claude; Lavarec, Martial; and Maurice, Jean, to Regie Nationale des Usines Renault; and Societe dite: Automobiles Peugeot. Automatic transmissions with planetary gears having a braking mechanism capable of being pre-assembled. 3,926,073, Cl. 74-753.000.
Rockwell International Corporation: *See—*
Cowell, Thomas E., 3,926,040.
Jones, Freeman B., Jr.; and Ratto, Joseph J., 3,926,834.
Mitchell, Daniel M.; and Ternowski, Robert H., 3,927,363.
Rod, Trygve R.: *See—*
Kercher, Dean S.; and Rod, Trygve R., 3,926,352.
Roedel, Charles W.; and Borysiewicz, Richard, to Milgo Electronics Corporation. Data modem having line verification and automatic disconnect features. 3,927,265, Cl. 179-2.0DP.
Roeder, Erwin: *See—*
Plesslinger, Gertraud Agnes Anna; Berthold, Frank; and Roeder, Erwin, 3,926,603.
Roemming, Karl: *See—*
Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,926,772.
Rogers, Edward F.; Dybas, Richard A.; and Hannah, John, to Merck & Co., Inc. Anticoccidial complexes. 3,926,935, Cl. 260-96.50R.
Rogers, Ralph L.: *See—*
Whitehead, William F.; and Rogers, Ralph L., 3,927,168.
Rogers, Victor Alfred Baden: *See—*
Ciastula, Tadeusz Leopold; Rogers, Victor Alfred Baden; and Balmford, David Ernest Hall, 3,926,536.
Rohm, Gunter Horst. Multiple-jaw power chuck. 3,926,446, Cl. 279-4.000.
Roland Offsetmaschinenfabrik Faber & Schleicher: *See—*
Preuss, Friedrich, 3,926,118.
Rollmann, Louis D., to Mobil Oil Corporation. Zeolite production. 3,927,171, Cl. 423-118.000.
Rolls-Royce (1971) Limited: *See—*
Johnson, Reginald Francis; Potts, Thomas James; and Jennings, Gordon Bridgman, 3,926,079.
Roncari, Angelo J.: *See—*
Powell, Orlo A., Jr.; and Roncari, Angelo J., 3,926,582.
Rosen, Ernst Anders Carl-Gustaf; and Rosen, Helena Mariana, to Alfa-Laval AB. Method for assaying catalase in milk and other liquids. 3,926,732, Cl. 195-103.50R.
Rosen, George; Carlick, Daniel J.; and Reiter, Ralph H., to Sun Chemical Corporation. Photopolymerizable compositions comprising monocarboxyl-substituted benzophenone reaction products. 3,926,638, Cl. 96-115.00R.
Rosen, George; Carlick, Daniel J.; and Reiter, Ralph H., to Sun Chemical Corporation. Photopolymerizable compositions comprising polycarboxysubstituted benzophenone reaction products. 3,926,639, Cl. 96-115.00R.
Rosen, George, to Sun Chemical Corporation. Photopolymerizable compositions comprising benzophenone reaction products. 3,926,640, Cl. 96-115.00P.
Rosen, George, to Sun Chemical Corporation. Photopolymerizable compositions comprising polycarboxysubstituted benzophenone reaction products. 3,926,641, Cl. 96-115.00P.
Rosen, Helena Mariana: *See—*
Rosen, Ernst Anders Carl-Gustaf; and Rosen, Helena Mariana, 3,926,732.
Rosenberg, Harry: *See—*
Harmsma, Guenter; Rosenberg, Harry; Laabs, Johannes; and Becker, Kunibert, 3,925,995.
Rosenberger, Siegfried: *See—*
Schwarzenbach, Kurt; and Rosenberger, Siegfried, 3,927,150.
Rosenkaimer GmbH: *See—*
Uthemann, Wolfgang; and Hofman, Josef, 3,926,202.
Rosenquest, Allen H.; Knipper, Aloysius J.; and Wood, Robert W., to Nabisco, Inc. Method of producing expanded cereal products of improved texture. 3,927,222, Cl. 426-621.000.
Rosenthal, Harold: *See—*
Kalafatas, Nicholas J.; Rosenthal, Harold; and Consolazio, George A., 3,927,221.
Rosinger, Sigurd, to Hoechst Aktiengesellschaft. Process for preparing straight-chain aliphatic and cyclo-aliphatic sulfonic acids. 3,926,757, Cl. 204-162.0HE.
Rosinski, Edward J.: *See—*
Plank, Charles J.; Rosinski, Edward J.; and Schwartz, Albert B., 3,926,782.
Ross, Jack. Water powered dishwasher. 3,926,668, Cl. 134-179.000.
Rossi, Albert; Jacobson, Norman; and Miller, Harold N., to Exxon Research & Engineering Co. Petroleum crude oils containing polymers comprised of C_{18}–C_{40} alpha-olefins have reduced tendency to deposit wax. 3,926,579, Cl. 44-62.000.
Rossi, Alberto: *See—*
Ferrini, Pier Giorgio; Haas, Georges; and Rossi, Alberto, 3,926,961.
Rostrup-Nielsen, Jens Richard, to Haldor Topsoe A/S. Process for the catalytic steam reforming of hydrocarbons. 3,926,583, Cl. 48-214.000.
Rosvold, Warren C., to Signetics Corporation. Semiconductor assembly with beam lead construction and method. 3,925,880, Cl. 29-578.000.
Roth, Clarence Edward, Jr.; Hughes, Robert L.; and Thompson, Kenneth F., to Gulf Oil Corporation, by said Clarence Edward Roth and Robert L. Hughes; and Champion International Corporation, by said Kenneth F. Thompson. Resin-coated carton blank. 3,927,245, Cl. 428-513.000.
Roth, Wolfgang, to Chemie Linz Aktiengesellschaft. Process for the prevention of frost heaves in fine-grained soils. 3,925,993, Cl. 61-36.00A.
Rothon, Roger Norman: *See—*
Cole, Susan Margaret; Mason, David Robert; and Rothon, Roger Norman, 3,926,658.
Rothstein, Seymour: *See—*
Parker, Sidney A.; and Rothstein, Seymour, 3,926,009.
Rovnyak, George; Narayanan, Venkatachala L.; Haughwitz, Rudiger D.; and Cimarusti, Christopher M., to E. R. Squibb & Sons, Inc. Substituted benzimidazolinethiones. 3,926,982, Cl. 260-243.00R.
Rovnyak, George; Narayanan, Venkatachala L.; Haugwitz, Rudiger D.; and Cimarusti, Christopher M., to E. R. Squibb & Sons, Inc. Substituted mercapto benzimidazoles. 3,927,014, Cl. 260-306.70T.
Rowe, Carleton N.: *See—*
Dickert, Joseph J., Jr.; and Rowe, Carleton N., 3,927,232.
Rowland, Ronald: *See—*
Haszeldine, Robert Neville; and Rowland, Ronald, 3,927,129.
Roy H. Cullen Research: *See—*
Cullen, Ray H.; and Aker, Jimmie R., 3,926,269.
Rubin, Howard: *See—*
Keegan, James J.; Patel, Girish; and Rubin, Howard, 3,926,870.
Rubino, Andrew M.: *See—*
Jones, John L.; Rubino, Andrew M.; and Lindahl, Charles B., 3,927,188.
Rudin, Ernst; and Weisskopf, Heinz, to H. Gertsch & Co. Aktiengesellschaft. Filter cartridge. 3,926,599, Cl. 55-387.000.
Ruebig, Helmut: *See—*
Ruebig, Herbert; and Ruebig, Helmut, 3,926,089.
Ruebig, Herbert; and Ruebig, Helmut, to Franz Rubig & Sohne KG. Safety pin. 3,926,089, Cl. 85-5.0CP.
Ruetman, Sven H.; and Watson, Richard N., to Dow Chemical Company, The. 6-Hydrazino-2,3,5-trihalo-4-alkylthio pyridines. 3,927,003, Cl. 260-294.80G.
Ruider, Guenther: *See—*
Dimroth, Peter; Gaeng, Manfred; and Ruider, Guenther, 3,926,943.
Rulcker, Carl-Edvard Jan, to Saab-Scania Aktiebolag. Arrangement of check valves. 3,926,216, Cl. 137-527.800.
Rundell, John Trethowan; and Pottage, Paul Richmond, to Tate & Lyle Limited. Production of cane sugar. 3,926,662, Cl. 127-48.000.
Ruof, Edgar J., to Goodyear Aerospace Corporation. Frequency quadrupler for anti-skid wheel speed sensor. 3,926,478, Cl. 303-21.00R.
Rupp, Walter: *See—*
Reuter, Martin; and Rupp, Walter, 3,927,113.
Rupprecht, Georg: *See—*
Patashnick, Harvey, 3,926,271.
Rusanov, Valentin Mikhailovich: *See—*
Ivanov, Mikhail Ivanovich; From, Anatoly Alexandrovich; Kiseley, Anatoly Efimovich; Nikitenko, Alexandr Alexandrovich; Rusanov, Valentin Mikhailovich; and Skobelev, Leonid Ivanovich, 3,926,939.
Rusco, Easborn. Lawnmower. 3,925,970, Cl. 56-14.700.
Rushworth, George E., to Exxon Nuclear Company Inc. Fuel rod pellet loading assembly. 3,925,965, Cl. 53-112.00R.
Russmann, Horst: *See—*
Bernhard, Horst; Esselborn, Reiner; Hesse, Reiner; and Russmann, Horst, 3,926,659.

Rustako, Anthony Joseph, Jr.: *See—*
Cox, Donald Clyde; Langseth, Rollin Edward; Reudink, Douglas Otto John; and Rustako, Anthony Joseph, Jr., 3,927,379.
Rusyanova, Natalya Dmitrievna: *See—*
Andreikov, Evgeny Iosifovich; Kostromin, Alexandr Stepanovich; and Rusyanova, Natalya Dmitrievna, 3,927,040.
Ruthel, Walter W.: *See—*
Evans, Leo G.; and Ruthel, Walter W., 3,925,886.
Ruti-Te Strake B.V.: *See—*
Vermeulen, Geert Jan; and Van Duynhoven, Adrianus Henricus, 3,926,224.
Ruzicka, Jaromir; and Lamm, Carl Goran, to Radiometer A/S. Electrode for potentiometric measurements. 3,926,764, Cl. 204-195.00F.
Ryan, Kelly P., to Blair Manufacturing Company. Hay stack disintegrating apparatus. 3,926,378, Cl. 241-154.000.
Ryk, Vladimir Izidorovich: *See—*
Zhukov, Oleg Nikolaevich; Medvinsky, Moisei Davidovich; and Ryk, Vladimir Izidorovich, 3,926,039.
S. A. Brush Company Limited: *See—*
Smyth, Donald Nation, 3,926,528.
S.A.E.S. Getters S.p.A.: *See—*
Barosi, Aldo, 3,926,832.
Saab-Scania Aktiebolag: *See—*
Rulcker, Carl-Edvard Jan, 3,926,216.
Saari, George W.; and Belliveau, Ronald L., to Lakso Company, Incorporated, The. Article counting and filling machine. 3,925,960, Cl. 53-78.000.
Sabin, Cullen M., to Geoscience Ltd. Self storing protest flag used in boat races. 3,926,139, Cl. 116-26.000.
Saenger, Dietrich: *See—*
Barzynski, Helmut; Marx, Matthias; Storck, Gerhard; and Saenger, Dietrich, 3,926,636.
Safeguard Automotive Corporation: *See—*
Schlenker, Harold Oscar; and Glover, Fay W., 3,926,532.
Sagiv, Jacob: *See—*
Margulies, Leon; Mazur, Yehuda; Sagiv, Jacob; and Yogev, Amnon, 3,926,524.
Saito, Mitsuo: *See—*
Shino, Makoto; and Saito, Mitsuo, 3,926,277.
Sakurada, Ichiro: *See—*
Okada, Toshio; Shimano, Yasunao; and Sakurada, Ichiro, 3,926,551.
Saldick, Jerome, to FMC Corporation. Biological treatment of plant waste streams to remove cyanuric acid. 3,926,795, Cl. 210-11.000.
Saleck, Wilhelm; Engelhard, Helmut; Himmelmann, Wolfgang; Bentz, Francis; and Mader, Helmut, to Agfa-Gevaert Aktiengesellschaft. Photographic material with polymeric stabilizers. 3,926,635, Cl. 96-114.000.
Sambrook, David John, to Imperial Metal Industries (Kynoch) Limited. Composite materials. 3,925,882, Cl. 29-599.000.
Sanders, Duane: *See—*
Graham, Robert H.; and Sanders, Duane, 3,926,336.
Sanderson, Kenneth R.: *See—*
Davis, Stephen A.; Dougherty, Keith H.; Levit, Alan D.; Hendrickson, Thomas A.; and Sanderson, Kenneth R., 3,926,088.
Sandoz, Inc.: *See—*
Houlihan, William J., 3,927,018.
Houlihan, William J.; and Nadelson, Jeffrey, 3,927,079.
Houlihan, William J.; and Manning, Robert E., 3,927,096.
Sandoz Ltd.: *See—*
Fleck, Fritz; Schmid, Horst; and Valenti, Salvatore, 3,926,969.
Henzi, Beat, 3,926,941.
Sandstrom, Harvey D., to Sklaris II, Inc. Receptacle for coins, currency and the like. 3,926,365, Cl. 229-72.000.
Sangiacomo, Fulvio. Controlled cutter for circular hosiery machines. 3,926,015, Cl. 66-147.000.
Sankyo Company Limited: *See—*
Nakajima, Eiichi; Morioka, Tadashi; Kurihara, Kozo; and Kobayashi, Takashi, 3,926,817.
Santa Maria, Richard C.; and Anastasio, Frank J., to Bobst Champlain, Inc. Rotary die mechanism with variable sheet velocity means for forming different sized blanks. 3,926,097, Cl. 93-58.20R.
Saponara, Domenick, to Raytheon Company. Electric igniter for gas burners. 3,926,172, Cl. 126-39.00E.
Sarantakis, Dimitrios: *See—*
Grant, Norman H.; and Sarantakis, Dimitrios, 3,926,937.
Saridakis, Nikolaus, to Volkswagenwerk Aktiengesellschaft. Method and apparatus for charging zinc electrodes in galvanic cells. 3,926,673, Cl. 136-31.000.
Sartler, Gary P.: *See—*
Henk, Michael G.; and Sartler, Gary P., 3,926,882.
Sasaki, Kenji: *See—*
Hayashi, Noriyuki; Sasaki, Kenji; Inaba, Hideaki; and Nonaka, Koushi, 3,927,144.
Sasnett, Russell M., to General Electric Company. Modular furnishings. 3,926,486, Cl. 312-198.000.
Sato, Giichi: *See—*
Katori, Tatsuhiko; Sato, Giichi; Kihara, Takashi; Yumoto, Norio; Makino, Shigeru; and Harada, Juntaro, 3,927,082.
Sato, Yashuhiro; and Hirabara, Chikao, to Oki Electric Industry Co., Ltd.; and Nippon Telegraph and Telephone Public Corporation. Non signal detection type AGC system. 3,927,381, Cl. 330-29.000.
Satoh, Kimio: *See—*
Kondo, Shinichi; Sezaki, Masaji; Koike, Makiko; Shimura, Masaru; Akita, Eiichi; Satoh, Kimio; Hamamoto, Kazuko; Niida, Taro; and Hara, Takeshi, 3,926,948.
Satomi, Toyokazu; Nagahara, Yasumori; and Narita, Teruo, to Ricoh Co., Ltd. Copy sheet stripping device. 3,926,429, Cl. 271-174.000.
Satomura, Masato, to Fuji Photo Film Co., Ltd. Process for synthesizing styrene type compounds. 3,927,133, Cl. 260-669.0QZ.
Sauer, Gale E.; and Hansen, Barton G., to Roblin Hope's Industries, Inc. Modular wall construction. 3,925,948, Cl. 52-481.000.
Sauer, Heinrich: *See—*
Birtigh, Gerhard; Parbel, Horst; and Sauer, Heinrich, 3,926,565.
Sauter, Dieter: *See—*
Schmalfeld, Paul; Sauter, Dieter; Peters, Werner; Ahland, Erwin; Bock, Burkhard; and Lehmann, Joachim, 3,926,576.
Sauter, Frederick J., to Eastman Kodak Company. Merocarbocyanine filter dyes. 3,926,970, Cl. 260-240.400.
Savostianoff, Dimitri; and Dubos, Denise, to Nobel Hoechst Chimie. Glycolurile derivatives. 3,927,024, Cl. 260-309.700.
Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; Ishikawa, Hisao; Yamada, Shozo; Yasuda, Yasushi; and Asada, Mitsuo, to Nippon Soda Company, Limited. 3,4-Dihydro-2H-pyrane-2,4-diones. 3,927,034, Cl. 260-343.500.
Sawyer, John H. Safety harness for a helmet. 3,925,822, Cl. 2-3.00R.
Schaefer, Hans: *See—*
Lussling, Theodor; Schaefer, Hans; and Weigert, Wolfgang, 3,926,856.
Lussling, Theodor; Schaefer, Hans; and Weigert, Wolfgang, 3,927,007.
Noll, Ewald; Schaefer, Hans; Schmid, Horst; and Weigert, Wolfgang, 3,926,744.
Schantz, Spencer C. Electric buzzer. 3,927,403, Cl. 340-396.000.
Scharfenberg, Walter Ernst Gustav; and Gunther, Friedrich Wilhelm, to Scharfenbergkupplung GmbH. Rail vehicle device for returning a central buffer coupling horizontally to its mid-position. 3,926,317, Cl. 213-20.000.
Scharfenbergkupplung GmbH: *See—*
Scharfenberg, Walter Ernst Gustav; and Gunther, Friedrich Wilhelm, 3,926,317.
Schatz, Douglas S., to Applied Materials, Inc. Logic system for protecting transistors. 3,927,352, Cl. 317-27.00R.
Scheid, Charles H.: *See—*
Turner, Thomas M.; and Scheid, Charles H., 3,926,050.
Scherenberg, Hans O., to Daimler-Benz Aktiengesellschaft. Rotary piston internal combustion engine. 3,926,152, Cl. 123-8.090.
Scherrer, Hanspeter; and Boller, Arthur, to Hoffmann-La Roche Inc. Liquid crystalline cinnamic acid esters. 3,927,066, Cl. 260-465.00D.
Scherrer, Hanspeter: *See—*
Boller, Arthur; and Scherrer, Hanspeter, 3,927,064.
Scherrer, Robert A., to Riker Laboratories, Inc. Alkoxy-substituted-2-nitro-3-phenylbenzofurans. 3,927,037, Cl. 260-346.20R.
Schibler, Luzius; and Merz, Jurg, to Ciba-Geigy AG. Process for the manufacture of low molecular reactive surface-active agents from carbamides. 3,927,089, Cl. 260-553.00R.
Schichijo, Yoshihisa: *See—*
Ohfuka, Toshio; Schichijo, Yoshihisa; Ichikawa, Yasushi; and Yamamoto, Katsuo, 3,926,930.
Schickedanz, Gerhard, to Adolf Hofmann Metall- u. Kunstoffwarenfabrik GmbH. Safety and security closure. 3,926,327, Cl. 215-218.000.
Schilling, Hartmut: *See—*
Labossier, William H.; and Schilling, Hartmut, 3,926,571.
Schittek, Hans-Heinz: *See—*
Meyer-Stoll, Hans-Albrecht; Wollner, Johannes; and Schittek, Hans-Heinz, 3,927,198.
Schlatter, Gerald Lance, to International Telephone & Telegraph Corporation. Gravitometer. 3,926,035, Cl. 73-32.00A.
Schlenker, Harold Oscar; and Glover, Fay W., to Safeguard Automotive Corporation. Quick releasable coupling. 3,926,532, Cl. 403-322.000.
Schlumberger Technology Corporation: *See—*
Ribeyre, Jean-Paul; and Marty, Claude, 3,926,252.
Schmalfeld, Paul; Sauter, Dieter; Peters, Werner; Ahland, Erwin; Bock, Burkhard; and Lehmann, Joachim, to Bergwerksverband GmbH; and Metallgesellschaft Aktiengesellschaft. Process for producing hot briquettes. 3,926,576, Cl. 44-10.00H.
Schmeidl, Karl: *See—*
Eisert, Manfred; and Schmeidl, Karl, 3,927,095.
Schmid, Erich: *See—*
Uebelhart, Heinrich; Schmid, Erich; and Wyser, Paul, 3,926,048.
Schmid, Horst: *See—*
Fleck, Fritz; Schmid, Horst; and Valenti, Salvatore, 3,926,969.
Noll, Ewald; Schaefer, Hans; Schmid, Horst; and Weigert, Wolfgang, 3,926,744.
Schmid, Markus: *See—*
Meier, Walter; Zeller, Josef; Koenig, Peter J.; Bruderer, Werner; and Schmid, Markus, 3,926,244.
Schmid, Rudolf: *See—*
Gutjahr, Manfred A.; Schmid, Rudolf; and Beccu, Klaus D., 3,926,671.
Schmidt, Manfred: *See—*
Riegler, Ernst; and Schmidt, Manfred, 3,926,481.
Schmidt, Richard F., to United States of America, General Counsel-Code GP. Single frequency, two feed dish antenna having switchable beamwidth. 3,927,408, Cl. 343-779.000.

Schmuck, Johann: *See—*
Hatz, Ernst; and Schmuck, Johann, 3,926,155.
Schmunk, John: *See—*
Shroy, Robert E.; and Schmunk, John, 3,926,222.
Schnabel, Horst: *See—*
Clauss, Karl; Schnabel, Horst; and Jensen, Harald, 3,926,981.
Schneider, Gerhart: *See—*
Lange, Jost; Schneider, Gerhart; and Zeh, Albert, 3,926,650.
Schneider, Walter: *See—*
Ersfeld, Heinrich; Nadolski, Klaus; Schneider, Walter; Schulte, Klaus; and Boden, Heinrich, 3,926,219.
Schneider, William P.: *See—*
Pike, John E.; and Schneider, William P., 3,927,075.
Schnurmann, Henri Daniel: *See—*
Pomeranz, Jehoshua Naphtali; and Schnurmann, Henri Daniel, 3,927,371.
Schoenfield, Palmer J., to Marvin Glass & Associates. Aerial back pack for use with a figure toy. 3,925,924, Cl. 46-201.000.
Scholl, Gunter; and Pauls, Joachim. Overhead cable system for power or information transmission. 3,927,248, Cl. 174-41.000.
Scholle Corporation: *See—*
Scholle, William R., 3,926,229.
Scholle, William R., to Scholle Corporation. Viscous material filling device. 3,926,229, Cl. 141-1.000.
Schroder, Paul B.; and Pollkotter, Gunter, to Leifeld & Co. Method of producing special wheel rims. 3,926,025, Cl. 72-84.000.
Schroeder Brothers Corporation: *See—*
Gaudet, Ronald M.; Michell, Samuel S.; and Kozy, Michael J., 3,926,806.
Schroeder, Roger H.: *See—*
Burns, Ronald N.; Landwehr, Dewayne A.; Schroeder, Roger H.; Vogelei, Robert A.; and Zeller, Gary P., 3,926,462.
Schroeder, Wilburn C. Hydrogenation of coal. 3,926,775, Cl. 208-10.000.
Schubert, Egon: *See—*
Plasser, Franz, deceased; Plasser, Erna, heir; Theurer, Josef; Schubert, Egon; and Riessberger, Klaus, 3,926,123.
Schuddemage, Horst-Dieter: *See—*
Strobel, Wolfgang; Jaenicke, Ottokar; Schuddemage, Horst-Dieter; and Jastrow, Horst, 3,927,142.
Schuhmacher, Alfred, to BASF Aktiengesellschaft. Production of anthraquinoneoxazoles. 3,926,996, Cl. 260-256.40Q.
Schuierer, Manfred, to Bruckner Apparatebau GmbH. Method of dyeing textile material made of synthetic fibres. 3,926,554, Cl. 8-174.000.
Schuler, Lawrence D.: *See—*
Micchelli, Albert L.; Legato, Gerard J.; Ganslaw, Stuart H.; and Schuler, Lawrence D., 3,927,199.
Schuller, Frederick T.; and Moore, Warren A., to United States of America, General Counsel-Code GP. Fluid journal bearings. 3,926,482, Cl. 308-9.000.
Schulte-Elte, Karl-Heinrich; and Jindra, Henri, to Firmenich S.A. 2,6,-6-Trimethyl-1-alkenoyl-cyclohexenones. 3,927,107, Cl. 260-586.00R.
Schulte, Klaus: *See—*
Ersfeld, Heinrich; Nadolski, Klaus; Schneider, Walter; Schulte, Klaus; and Boden, Heinrich, 3,926,219.
Schultz, Jay Ward: *See—*
Benjamin, John Stanwood; and Schultz, Jay Ward, 3,926,568.
Schultz, Robert S. Valve construction for a pressure operated container. 3,926,349, Cl. 222-402.220.
Schundehutte, Karl-Heinz: *See—*
Nickel, Horst; and Schundehutte, Karl-Heinz, 3,926,546.
Schurrer, Josef; and Meyer, Josef, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Apparatus for non-contact, accurate and continuous determination of surface temperature on a part. 3,926,053, Cl. 73-351.000.
Schuster, Joachim; and Seien, Hermann, to Babcock & Wilcox, Limited. Welding system. 3,927,295, Cl. 219-125.00R.
Schuster, Samuel R.: *See—*
Kopito, Louis; Schuster, Samuel R.; and Kosasky, Harold, 3,926,037.
Schuylkill Chemical Company: *See—*
Mecca, Sebastian B., 3,927,021.
Schwartz, Albert B.: *See—*
Plank, Charles J.; Rosinski, Edward J.; and Schwartz, Albert B., 3,926,782.
Schwarzenbach, Kurt; and Rosenberger, Siegfried, to Ciba-Geigy Corporation. Bicyclic phosphorus compounds. 3,927,150, Cl. 260-937.000.
Schwarzkopf, Joachim: *See—*
Wefers, Norbert; Militz, Uwe; Unglaube, Uwe; and Schwarzkopf, Joachim, 3,927,303.
Schwerdt, Paul: *See—*
Paul, Jurgen; Kostelezky, Walter; and Schwerdt, Paul, 3,927,339.
Sciortino, August M. Pilfer-proof locking cover for a coin box. 3,926,366, Cl. 232-15.000.
Sciulli, Joseph A.; Campanella, Samuel Joseph; and Costales, Rene, to Communications Satellite Corporation. Speech predictive encoding communication system. 3,927,268, Cl. 179-15.0BW.
SCM Corporation: *See—*
Bastian, Donald G., 3,926,294.
Corbett, Paul M.; and Fedock, Michael P., 3,926,246.
Eaton, John Littell, Jr.; Brill, Richard Henry; and Myers, Walter E., 3,926,333.
Scofield, Carlie D. Automotive air conditioner and method of operating the same. 3,926,000, Cl. 62-121.000.
Scola, Daniel A., to United Technologies Corporation. Curable crack-resistant epoxy resin. 3,926,903, Cl. 260-42.280.
Scola, Daniel A., to United Technologies Corporation. Curable crack-resistant epoxy resin. 3,926,904, Cl. 260-42.280.
Scott, Billy Joe, to Stewart/Walker Company. Apparatus for removing containers from packages. 3,926,322, Cl. 214-305.000.
Scott Paper Company: *See—*
Edelson, Nathan Allen; and Faessinger, Robert W., 3,926,872.
Scott, Paul B.: *See—*
Azzarelli, Teodoro; Muntz, Eric P.; and Scott, Paul B., 3,927,322.
Seaco Computer-Display Incorporated: *See—*
Heldenbrand, Stanley W.; Johnson, David L.; and Mote, Neil H., 3,926,428.
Sealol, Inc.: *See—*
Muller, Heinz Konrad, 3,926,442.
Searle, Robert J. G.; and Woodall, Roger E., to Shell Oil Company. Pesticidal cyclopropane derivatives. 3,927,068, Cl. 260-468.00H.
Sease, John D.: *See—*
Bradley, Ronnie A.; Miller, William H.; and Sease, John D., 3,926,344.
Seebode, Albert; Appel, Eggert; and Geisler, Gottfried, to Fischer & Porter Co. Quadrature-voltage balancing circuit or electromagnetic flowmeter. 3,926,049, Cl. 73-194.0EM.
Seib, James N.; and Willis, Harry G., to United States of America, Navy. Water trap for pitot static system. 3,926,594, Cl. 55-159.000.
Seien, Hermann: *See—*
Schuster, Joachim; and Seien, Hermann, 3,927,295.
Seino, Yoshio: *See—*
Horiguchi, Shojiro; Nakamura, Michiei; Nakajima, Keiji; and Seino, Yoshio, 3,926,830.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Shibata, Yutaka; Kodera, Yoshiaki; Tanaka, Mitsuru; Kamiyama, Fumio; and Nakatan, 3,926,918.
Selinder, Bjorn P.; and Selinder, Bo Eric, to Semo Incorporated. Power eraser. 3,925,842, Cl. 15-3.530.
Selinder, Bo Eric: *See—*
Selinder, Bjorn P.; and Selinder, Bo Eric, 3,925,842.
Selleck, Robert A.: *See—*
Johnson, John W.; and Selleck, Robert A., 3,926,388.
Sellstedt, John H.: *See—*
Teller, Daniel M.; Sellstedt, John H.; and Guinosso, Charles J., 3,926,984.
Selvia, Ray E.; and Barden, Allan D., to All State Vending Equipment, Inc. Carbonated water producing apparatus. 3,926,342, Cl. 222-129.100.
Semersky, Frank E.: *See—*
Gray, Don N.; Keyes, Melvin H.; and Semersky, Frank E., 3,926,734.
Semo Incorporated: *See—*
Selinder, Bjorn P.; and Selinder, Bo Eric, 3,925,842.
Senco Products, Inc.: *See—*
Becht, Carl T., 3,925,955.
Senes, Michel; Lhonore, Pierre; Pottier, Michel; and Quibel, Jacques, to Societe Chimique de la Grande Paroisse et Produits Chimiques. Catalytic oxidation of ammonia. 3,926,853, Cl. 252-456.000.
Sensor Technology, Inc.: *See—*
Weinstein, Harold, 3,925,879.
Seo, Yoshiro: *See—*
Ichikawa, Yoshihiro; Fujisawa, Tetsuo; and Seo, Yoshiro, 3,926,651.
Sera, Katsuya; and Kasari, Akira, to Kansai Paint Company, Limited. Aqueous electrophoretic coating compositions comprised of polycarboxylic acid binder resin and sparingly soluble alkaline earth metal molybdate. 3,926,761, Cl. 204-181.000.
Seragnoli, Ariosto, deceased; by Seragnoli, Leonina Ricci, heir and legal representative; by Seragnoli, Giorgio, heir and legal representative; and by Seragnoli, Daniela, heir and legal representative, to G.D. Societa in Accomandita Semplice di Enzo Seragnoli e Ariosto Seragnoli. Device for transferring batches of cigarettes from a formation line to a packing line for them to be packeted. 3,926,300, Cl. 198-20.00C.
Seragnoli, Daniela, heir and legal representative: *See—*
Seragnoli, Ariosto, deceased; Seragnoli, Leonina Ricci, heir and legal representative; Seragnoli, Giorgio, heir and legal representative; and Seragnoli, Daniela, heir and legal representative, 3,926,300.
Seragnoli, Giorgio, heir and legal representative: *See—*
Seragnoli, Ariosto, deceased; Seragnoli, Leonina Ricci, heir and legal representative; Seragnoli, Giorgio, heir and legal representative; and Seragnoli, Daniela, heir and legal representative, 3,926,300.
Seragnoli, Leonina Ricci, heir and legal representative: *See—*
Seragnoli, Ariosto, deceased; Seragnoli, Leonina Ricci, heir and legal representative; Seragnoli, Giorgio, heir and legal representative; and Seragnoli, Daniela, heir and legal representative, 3,926,300.
Sergeys, Francis J., to W. R. Grace & Co. Porous ceramics-exhaust oxidation catalyst. 3,926,851, Cl. 252-455.00R.
Sexton, Peter, to Texas Instruments Incorporated. Composite wire and method of making. 3,926,573, Cl. 29-197.000.
Seyler, Jay Kenneth: *See—*
Hughes, John Lawrence; Seyler, Jay Kenneth; and Liu, Robert Chung-Huang, 3,926,938.

Seymour, Donald Edwin; da Costa, Nicholas Mario; and Charville, William Thomas, to Hydron Limited. Cosmetic compositions employing certain compolymers. 3,927,203, Cl. 424-61.000.
Seymour, Theodore Joseph: *See—*
Geiger, Kenneth Daniel; Horvath, Steven Joseph; Kallay, Victor Paul; Seymour, Theodore Joseph; Watson, Thorpe Wesley; and Zervoudis, John, 3,926,247.
Sezaki, Masaji: *See—*
Kondo, Shinichi; Sezaki, Masaji; Koike, Makiko; Shimura, Masaru; Akita, Eiichi; Satoh, Kimio; Hamamoto, Kazuko; Niida, Taro; and Hara, Takeshi, 3,926,948.
Shalimova, Zoya Stepanovna: *See—*
Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovidh; Zakharova, Nina Vasilievna; Golubenko, Mikhail Afanasievich; Tolstikov, Genrikh Alexandrovich; Kholodovskaya, Rakhil Samoilovna; Shalimova, Zoya Stepanovna; Legostaeva, Taisia Vasilievna; Popov, Vasily Dmitrievich; and Dolidze, Vladimir Romanovich, 3,927,038.
Shannon, Richard F.; and Helser, Jerry L., to Owens-Corning Fiberglas Corporation. Method of building and maintaining slurry consistency. 3,926,653, Cl. 106-119.000.
Shapiro, Justin J.: *See—*
Hesse, Sarah; and Shapiro, Justin J., 3,925,899.
Shapiro, Nelson H.: *See—*
Board, Richard G.; and Shapiro, Nelson H., 3,926,385.
Sharp, William J., Jr., to Goodyear Tire & Rubber Company, The. Force Variation measurements on unvulcanized tires. 3,926,704, Cl. 156-126.000.
Shatzel, Mary P., administratrix: *See—*
Shatzel, Norman W., deceased, 3,926,085.
Shatzel, Norman W., deceased (by Shatzel, Mary P., administratrix), to American Optical Corporation. Specimen feed for a microtome. 3,926,085, Cl. 83-718.000.
Shavel, John, Jr.: *See—*
Brown, Richard E.; and Shavel, John, Jr., 3,927,023.
Wittekind, Raymond R.; and Shavel, John, Jr., 3,927,022.
Shaw, Robert B., to Shell Oil Company. Portable hardness inspection tool. 3,926,041, Cl. 73-85.000.
Shay, Edward G.: *See—*
O'Neill, John J.; Komor, Joseph A.; Babcock, Thomas E.; Edmundson, Robert J.; and Shay, Edward G., 3,926,828.
Sheinson, Ronald S.: *See—*
Williams, Frederick W.; and Sheinson, Ronald S., 3,926,562.
Sheldrick, George Edward, to Ilford Limited. Photometric apparatus including a rotatable optical density wedge. 3,926,525, Cl. 356-205.000.
Shell Oil Company: *See—*
Gale, Laird H., 3,926,781.
Pilgram, Kurt H. G.; Jackson, Earl K.; and Kollmeyer, Willy D., 3,927,062.
Searle, Robert J. G.; and Woodall, Roger E., 3,927,068.
Shaw, Robert B., 3,926,041.
Sheller-Globe Corporation: *See—*
Powell, Richard E.; and Starck, Robert W., 3,927,161.
Sherman, Edward: *See—*
Gilbert, Eugene C.; Jones, Robert E.; McLean, Donald C.; and Sherman, Edward, 3,927,106.
Sherritt Gordon Mines Limited: *See—*
Fustukian, David A. W.; Kushnir, Bud W.; Norris, Leon F.; and Fraser, Robert W., 3,926,691.
Sherwin, Owen W.: *See—*
Crissy, Charles F.; Sherwin, Owen W.; and Corbin, Christopher L. T., 3,926,467.
Sherwin-Williams Company, The: *See—*
Petty, John Lee; and Amano, George Minoru, 3,926,874.
Sheth, Rajesh N.: *See—*
Guzy, Raymond L.; and Sheth, Rajesh N., 3,926,900.
Shibata, Uichi: *See—*
Tsuruoka, Takashi; Niwa, Tomizo; Shibata, Uichi; Inouye, Shigeharu; and Niida, Taro, 3,927,001.
Shibata, Yutaka; Kodera, Yoshiaki; Tanaka, Mitsuru; Kamiyama, Fumio; and Nakatan, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Process for producing polyvinyl acetal. 3,926,918, Cl. 260-73.00L.
Shibatani, Juichi; and Kondo, Toshiyuki, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Anti-skid brake control system for vehicles. 3,926,480, Cl. 303-21.00F.
Shigeo, Nozawa, to Kyowa Kagakukogyo Kabushiki Kaisha. Method and apparatus for water and air culture of plants. 3,925,926, Cl. 47-1.200.
Shima, Seisuke, to Sumitomo Metal Industries Limited. Railway axle friction snubber assembly. 3,926,127, Cl. 105-224.00R.
Shimabukuro, Seiki. Method for turning a flexible tube inside out. 3,927,164, Cl. 264-95.000.
Shimada, Takeo: *See—*
Horie, Ikutaro; Miyazako, Taksuhi; and Shimada, Takeo, 3,926,869.
Shimada, Toshikazu; Komatsubara, Kiichi; Hasegawa, Susumu; and Kato, Yoshiki, to Hitachi, Ltd. Method for producing solid material having amorphous state therein. 3,926,682, Cl. 148-1.500.
Shimano, Yasunao: *See—*
Okada, Toshio; Shimano, Yasunao; and Sakurada, Ichiro, 3,926,551.
Shimizu, Hiroshi: *See—*
Tanaka, Eiichiro; Nishimura, Katsuo; Shimizu, Hiroshi; and Koshi, Masao, 3,926,502.
Shimizu, Katsuhisa; and Minami, Norio, to Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha. Hot-melt compositions comprising E/VA copolymer and hydrogenated petroleum resin. 3,926,878, Cl. 260-27.0EV.
Shimizu, Senzo: *See—*
Huang, Ching Yun; Shimizu, Senzo; and Adachi, Hiroyuki, 3,926,890.
Shimura, Masaru: *See—*
Kondo, Shinichi; Sezaki, Masaji; Koike, Makiko; Shimura, Masaru; Akita, Eiichi; Satoh, Kimio; Hamamoto, Kazuko; Niida, Taro; and Hara, Takeshi, 3,926,948.
Shin-Shirasuma Electric Corporation: *See—*
Hirabayashi, Nobuhiro, 3,926,387.
Shinetsu Chemical Company: *See—*
Koyanagi, Shunichi; Arai, Shigeru; Tajima, Shigenobu; and Kurimoto, Kazuhiko, 3,926,931.
Takamizawa, Minoru; Shinohara, Toshio; and Takita, Masatoshi, 3,927,057.
Shino, Makoto; and Saito, Mitsuo, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle drawn by suction against the surface of travel. 3,926,277, Cl. 180-115.000.
Shinoda, Kenichi: *See—*
Tsuchida, Takashi; Shinoda, Kenichi; Yamamoto, Kohei; Murata, Tomoya; and Maeda, Yoshihiro, 3,926,678.
Shinohara, Toshio: *See—*
Takamizawa, Minoru; Shinohara, Toshio; and Takita, Masatoshi, 3,927,057.
Shionogi & Co., Ltd.: *See—*
Kondo, Eiji; and Mitsugi, Takashi, 3,926,728.
Shirafuji, Hideo: *See—*
Kanzaki, Toshihiko; Fujisawa, Yukio; Shirafuji, Hideo; Nara, Kiyoshi; and Yoneda, Masahiko, 3,926,729.
Shiraishi, Teruhiko: *See—*
Yoshioka, Kengo; and Shiraishi, Teruhiko, 3,926,289.
Shively, Lawrence A.; and Hoy, Robert P., to Mechaneer, Inc. Apparatus and method for selecting and transferring a stack of laminations for an electric motor or the like. 3,926,320, Cl. 214-8.50C.
Showa Denko Kabushiki Kaisha: *See—*
Oushiba, Takashi, 3,927,183.
Shroy, Robert E.; and Schmunk, John, to Hancock Brick and Tile Company. Corrugated tubing with integral coupling means thereon. 3,926,222, Cl. 138-122.000.
Shroyer, Milton B. Removable outrigger float and mounting device. 3,926,136, Cl. 114-123.000.
Shubert, Roland H., to Maryland Patent Development Co., Inc. Magnetic separation of particular mixtures. 3,926,789, Cl. 209-8.000.
Shultz, Jay S., to Johnson & Johnson. Resin compositions, methods of applying the same to porous materials, and the resulting products. 3,927,236, Cl. 428-304.000.
Shunichi, Okamura. Sugar cane harvesting machine. 3,925,969, Cl. 56-13.900.
Shvedov, Vasily Ivanovich: *See—*
Grinev, Alexei Nikolaevich; Shvedov, Vasily Ivanovich; Sytina, Evgenia Nikolaevna; Bogdanova, Nadezhda Sergeevna; Nikolaeva, Irina Sergeevna; Pershin, Grigory Nikolaevich; and Guskova, Tatyana Anatolievna, 3,927,125.
Siczek, Bernard, to Graco Inc. Spray gun valve. 3,926,376, Cl. 239-583.000.
Sieberer, Karl-Heinz: *See—*
Koziol, Konrad; Rathjen, Hans-Carl; and Sieberer, Karl-Heinz, 3,926,773.
Siegel, Jack W., to Chevron Research Company. Integrated distillation and hydrodesulfurization process for jet fuel production. 3,926,785, Cl. 208-211.000.
Siegrist, Rudolf: *See—*
Jaccard, Roland; Hostettler, Paul; and Siegrist, Rudolf, 3,926,917.
Siemens Aktiengesellschaft: *See—*
Frie, Wolfgang; Grave, Burghard; Strasser, Karl; and Gutbier, Heinrich, 3,926,676.
Kohlmuller, Hans; and Kohlmuller, Gerlind, 3,926,675.
Kostka, Hana, 3,926,850.
Kunne, Kurt; and Wittkopp, Fritz, 3,927,326.
Lindner, Heinz-Joachim, 3,927,234.
Sussmann, Erhard, 3,926,715.
Sien Equipment Company: *See—*
Sien, Gerald Bruce, 3,926,276.
Sien, Gerald Bruce, to Sien Equipment Company. Five man mine personnel carrier. 3,926,276, Cl. 180-89.00R.
Sieurin, Donald; and Kinnicutt, Roger, Jr., to Morgan Construction Company. Coil forming and transfer apparatus. 3,926,382, Cl. 242-79.000.
Signetics Corporation: *See—*
Cauge, Thomas P.; and Kocsis, Joseph, 3,926,694.
Rosvold, Warren C., 3,925,880.
Silver, Edward S.; and Tucker, Robert E., to Computer Specialties Corporation. Bidirectional web medium drive. 3,926,513, Cl. 353-26.000.
Simmonds, Harold V. Transom mounted ski rack and tow rope reel support. 3,925,836, Cl. 9-1.00D.
Simon-Carves Limited: *See—*
Lowe, Kenneth, 3,926,242.
Simpson, David A.: *See—*
Breslow, David S.; and Simpson, David A., 3,926,642.
Simpson, Frederick Granville: *See—*
Gillies, Barrie Andrew; and Simpson, Frederick Granville, 3,926,060.

Singer Company, The: *See—*
Adahan, Carmeli, 3,926,295.
Herron, William; Adams, Kenneth D.; and Petronchak, John, 3,926,133.
Lear, Edward C.; and Fitton, Nigel S., 3,926,132.
Zaleski, John F., 3,927,380.
Singh, Kanwar J., to McCrosky Tool Corporation. Clamping assembly for cutter bits. 3,925,868, Cl. 29-96.000.
Sisco, Willie J., Jr.; Long, Cecil L.; and Kifer, James M., to Coyne Cylinder Company. Perlite acetylene cylinder filler composition. 3,926,652, Cl. 106-118.000.
Sitter, Matthew M.: *See—*
Meyers, Robert M.; Kutch, Edward F.; and Sitter, Matthew M., 3,925,947.
Siwek, Erwin G.: *See—*
Taylor, Dale F.; and Siwek, Erwin G., 3,926,670.
Six, Hugh A.: *See—*
Brach, Paul J.; and Six, Hugh A., 3,927,026.
SKF Industrial Trading and Development Company B.V.: *See—*
Kjellberg, Jonas F., 3,926,261.
Parkins, Derek Ray, 3,926,484.
Van Nederveen, Hans Bertil, 3,926,306.
Sklaris II, Inc.: *See—*
Sandstrom, Harvey D., 3,926,365.
Skobelev, Leonid Ivanovich: *See—*
Ivanov, Mikhail Ivanovich; From, Anatoly Alexandrovich; Kiseley, Anatoly Efimovich; Nikitenko, Alexandr Alexandrovich; Rusanov, Valentin Mikhailovich; and Skobelev, Leonid Ivanovich, 3,926,939.
Skornyakov, Eduard Petrovich: *See—*
Klementi, Toe Jokhannesovich; Herem, Henn-Jaak Eerovich; and Skornyakov, Eduard Petrovich, 3,926,589.
Skorupinski, Roy E. Water power machine and under sea, under water generator station. 3,927,330, Cl. 290-54.000.
Slator, Damon T., to Bowen Tools, Inc. Wireline control system and method. 3,926,260, Cl. 166-315.000.
Sloane, Clifford, to Cam Gears Limited. Manufacture of toothed workpieces. 3,926,091, Cl. 90-1.400.
Smay, Gary Lynn; Van Caporali, Ronald; and Southwick, Russell Duty, to Glass Container Manufacturers Institute, Inc. Method for applying an inorganic titanium coating to a glass surface. 3,926,604, Cl. 65-60.000.
Smith, Brian Robson; and Tomlinson, Kenneth, to Colgate-Palmolive Company. Superfatted soap and process of producing it. 3,926,829, Cl. 252-132.000.
Smith, Curtis J., to Container Corporation of America. Winding convolute can bodies. 3,926,098, Cl. 93-81.00R.
Smith, Everett C., to American Glass Research, Inc. Recovery system for spraying apparatus. 3,926,103, Cl. 98-115.0SB.
Smith, Francis Fabian: *See—*
Lee, Henry Lawrence, II; Smith, Francis Fabian; and Swartz, Michael Lawrence, 3,926,906.
Smith, Gordon C., to Glaus, Pyle, Schomer, Burns & DeHaven, Inc. Material handling and conveying device. 3,926,302, Cl. 198-53.00R.
Smith, James W. Survival suit. 3,925,839, Cl. 9-331.000.
Smith, Leonard S., to Century Mfg. Co., Inc. Method for making and insulating a coil tap. 3,925,885, Cl. 29-605.000.
Smith, Lowell R., to Monsanto Company. Preparation of 1,1,2,3-tetrachloropropene from 2,3-trichloropropane. 3,926,758, Cl. 204-163.00R.
Smyth, Donald Nation, to S. A. Brush Company Limited. Carpet shampoo apparatus. 3,926,528, Cl. 401-274.000.
Snam Progetti S.p.A.: *See—*
Antonini, Eraldo; and I.S.F. Societa per Azioni, 3,926,726.
Snow, Kenneth T.; and Snow, Kenneth T., Jr. Corner bracket with hip saddle. 3,925,954, Cl. 52-752.000.
Snow, Kenneth T., Jr.: *See—*
Snow, Kenneth T.; and Snow, Kenneth T., Jr., 3,925,954.
Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Piccolo, Luigi; and Paolinelli, Antonio, 3,926,608.
Societe Anonyme Cockerill-Ougree-Providence et Esperance-Longdoz: *See—*
Liesenborghs, Roland Cesar Amand; and Leroy, Vincent Marguerite, 3,926,688.
Societe Chimique de la Grande Paroisse et Produits Chimiques: *See—*
Senes, Michel; Lhonore, Pierre; Pottier, Michel; and Quibel, Jacques, 3,926,853.
Societe de Prospection et d'Inventions Techniques SPIT: *See—*
Dorgnon, Roger, 3,926,266.
Societe d'Etudes de Machines Thermiques: *See—*
Bastenhof, Dirk, 3,926,163.
Societe d'Etudes du Procede NORIDEM: *See—*
Glaser, Heinz; and Zlatareff, Vassil, 3,926,707.
Societe dite: Automobiles Peugeot: *See—*
Roche, Jean Claude; Lavarec, Martial; and Maurice, Jean, 3,926,073.
Societe Industrielle Generale de Mecanique Appliquee S.I.G.M.A.: *See—*
Vuaille, Andre, 3,926,164.
Societe Nationale des Poudres et Explosifs: *See—*
Humbert, Jean Jacques; Thomas, Jean Pierre Francis; Brut, Gerard Yvan; and Gounou, Jean Marie Joseph Elie, 3,926,697.
Sodal, Ingvar E.; Hoivik, Lars; Micco, Alexander J.; Weil, John V.; and Baer, Norman W., to Regents of the University of Colorado. Method and inlet control system for controlling a gas flow sample to an evacuated chamber. 3,926,209, Cl. 137-487.500.
Soga, Hiromu: *See—*
Sugai, Tetuya; Soga, Hiromu; Motegi, Masayosi; and Kanno, Hideo, 3,927,394.
Sohm, Jean-Claude: *See—*
Machat, Jean-Yves; and Sohm, Jean-Claude, 3,926,677.
Sokolov, Vladimir Dmitrievich: *See—*
Orlov, Petr Nikolaevich; Nesterov, Jury Ivanovich; Kudashov, Vasily Yakovlevich; Zimnyakov, Alexandr Vasilievich; Ermakova, Irina Nikolaevna; Bogomolov, Igor Vasilievich; Nirman, Efim Matveevich; and Sokolov, Vladimir Dmitrievich, 3,925,936.
Sollami, Blase J., to Bendix Corporation, The. Head assembly for a cryogenic cooler. 3,926,011, Cl. 62-514.000.
Sonic Corporation: *See—*
D'Urso, Anthony M., 3,926,413.
Sonnengruber, Erhard. Dry-cleaning agent. 3,926,831, Cl. 252-171.000.
Sony Corporation: *See—*
Ando, Tetsuo; and Hirata, Yoshimi, 3,927,418.
Oki, Ryuji, 3,927,382.
Southwick, Russell Duty: *See—*
Smay, Gary Lynn; Van Caporali, Ronald; and Southwick, Russell Duty, 3,926,604.
Sowinski, Francis Alexander; and Vogt, B. Richard, to E. R. Squibb & Sons, Inc. 1,2,4-Benzothiadiazines. 3,926,977, Cl. 260-243.00D.
Space Age Industries, Inc.: *See—*
Hemmelsbach, Richard J., 3,925,942.
Spannhake, Dieter, to Robert Bosch Fernsehanlagen GmbH. System for stabilization of working point in picture tubes. 3,927,346. Cl. 315-30.000.
Spector, George: *See—*
Tucker, John L.; and Spector, George, 3,925,921.
Speece, Richard E. Pressurized gas transfer system. 3,926,588, Cl. 55-52.000.
Speiser, Jeffrey M.: *See—*
Bond, James W.; and Speiser, Jeffrey M., 3,926,367.
Sperry Rand Corporation: *See—*
Miller, Harry, 3,927,306.
Sperry Rand Limited: *See—*
Gillies, Barrie Andrew; and Simpson, Frederick Granville, 3,926,060.
Spiegelberg, Hans: *See—*
Kyburz, Emilio; and Spiegelberg, Hans, 3,927,128.
Spiess, Bernhard, to Hoechst Aktiengesellschaft. Process for the preparation of 2-amino-4-nitro-anisole. 3,927,098, Cl. 260-575.000.
Spiro, Irving, to All Orthopedic Appliances Inc. Dorsal lumbo sacral support. 3,926,183, Cl. 128-78.000.
Spitz, David A., to Industrial Nucleonics Corporation. Dry line controller. 3,926,719, Cl. 162-253.000.
Sprick, Walter F.: *See—*
Lovich, John W.; Meller, Oscar W.; and Sprick, Walter F., 3,926,243.
Spurney, Richard W., to Bicron Corporation. Processing alkali metal halide salts for growing into crystals in accordance with stockbarger process. 3,926,566, Cl. 23-301.0SP.
Squires, Arthur M. Electrostatic filtration in panel bed. 3,926,587, Cl. 55-12.000.
Squires, Arthur M.; and Lee, Kun-Chieh, to Squires, Arthur M. Precoating panel bed for filtering aerosol of micron-size particulates. 3,926,593, Cl. 55-96.000.
SS Pharmaceutical Co., Ltd.: *See—*
Katori, Tatsuhiko; Sato, Giichi; Kihara, Takashi; Yumoto, Norio; Makino, Shigeru; and Harada, Juntaro, 3,927,082.
Stabholz, Ludvig M., to Meditrac. Lumbar traction apparatus. 3,926,182, Cl. 128-75.000.
Stabilator AB: *See—*
Pulk, Elgas, deceased; Hallsenius, Carlgustaf, Administrator; and Noren, John Paul, 3,926,345.
Stacy, Donald G.: *See—*
Ladd, Floyd N.; and Stacy, Donald G., 3,925,931.
Ladd, Floyd N.; and Stacy, Donald G., 3,925,932.
Ladd, Floyd N.; Raveschot, Marcel R.; and Stacy, Donald G., 3,926,066.
Stahlecker, Fritz; and Stahlecker, Hans. Apparatus for piecing a thread in an open-end spinning unit. 3,925,975, Cl. 57-34.00R.
Stahlecker, Hans: *See—*
Stahlecker, Fritz; and Stahlecker, Hans, 3,925,975.
Stahmann, James R.; and Kalakowsky, Charles B., to United States of America, Air Force. Spool for wire deployment. 3,926,386, Cl. 242-118.000.
Stalego, Charles J., to Owens-Corning Fiberglas Corporation. Glass fiber stream feeder. 3,926,600, Cl. 65-1.000.
Stalter, Robert J., Sr., to Goodyear Tire & Rubber Company, The. Method of molding a polyurethane foam involving use of a fan-like spray nozzle. 3,927,162, Cl. 264-51.000.
Stamicarbon, B.V.: *See—*
van de Moesdijk, Cornelis G. M.; and Thomas, Andreas M. J., 3,927,108.
Standard Electric Time Corporation: *See—*
Cooper, Glenn F., 3,927,404.
Standard Oil Company: *See—*
Cengel, John A.; and Puskas, Imre, 3,927,041.
Henk, Michael G.; and Sartler, Gary P., 3,926,882.
Hensley, Linda W.; and Li, George S., 3,926,871.
Karayannis, Nicholas M.; Khelghatian, Missak; and Lee, Sam S., 3,926,928.

Li, George S.; and Coffey, Gerald P., 3,926,926.
Menzl, Roland L., 3,926,777.
Stanford Research Institute: *See—*
Lipska, Anne E., 3,926,947.
Stanley Aviation Corporation: *See—*
Nordine, Louis R., 3,926,391.
Stanley, Lester N.: *See—*
Roberts, Stiles M.; and Stanley, Lester N., 3,926,945.
Stapley, Edward O.; and Mata, Justo Martinez, to Merck & Co., Inc. Antibiotic Ensanchomycin. 3,927,210, Cl. 424-118.000.
Starck, Robert W.: *See—*
Powell, Richard E.; and Starck, Robert W., 3,927,161.
Starkey, Caroline J.: *See—*
Glover, George M., 3,925,973.
Stary, Marvin L.; Brown, Edward L.; and Pridonoff, Eric L. Recovery of flammable vapors. 3,926,230, Cl. 141-45.000.
Stauffer Chemical Company: *See—*
Klein, George I., 3,927,179.
Mihailovski, Alexander, 3,927,086.
Mihailovski, Alexander, 3,927,219.
Mihailovski, Alexander, 3,927,220.
Steel Web Corporation: *See—*
Jackson, Edgar D.; and Jackson, Thomas E., 3,925,951.
Steidinger, Donald J., to Wallace Business Forms, Inc. Thin frame stencil assembly. 3,926,113, Cl. 101-128.100.
Stendel, Wilhelm: *See—*
Enders, Edgar; and Stendel, Wilhelm, 3,927,217.
Stephens, Donald E., to Beckman Instruments, Inc. Temperature stabilized water jacket chromatographic column. 3,926,800, Cl. 210-31.00C.
Stephens, Galen H.; and Revill, Charles L. Flux recovery unit. 3,926,788, Cl. 209-3.000.
Steprath, Werner. Centrifuge construction. 3,926,661, Cl. 127-19.000.
Sterling Drug Inc.: *See—*
Ackerman, James H., 3,926,975.
Bailey, Denis M., 3,927,000.
Steube, Kenneth E., to McDonnell Douglas Corporation. Glow discharge-tumbling vapor deposition apparatus. 3,926,147, Cl. 118-49.100.
Stevens, Arthur Royden; and Cartwright, Ronald Forrester, to Centrax Limited. Copying machine tools. 3,925,937, Cl. 51-145.00R.
Stevens, Gerald L.: *See—*
Duke, Spencer E.; and Stevens, Gerald L., 3,926,047.
Stevens, Harry M., to Monsanto Company. Method of concentrating gallium. 3,927,172, Cl. 423-129.000.
Stevens, Timothy S., to Dow Chemical Company, The. Method and apparatus for quantitative chromatographic analysis of cationic species. 3,926,559, Cl. 23-230.00R.
Stevison, Donald F.: *See—*
Phillippi, Conrad M.; Stevison, Donald F.; and Ekman, Willard J., 3,926,034.
Stewart, James A.; and Zellmer, Neale A., to GTE Automatic Electric Laboratories Incorporated. Ringer power generator circuit for subscriber carrier station terminal. 3,927,266, Cl. 179-2.50R.
Stewart, Richard Gordon: *See—*
Harrap, John; and Stewart, Richard Gordon, 3,926,665.
Stewart/Walker Company: *See—*
Scott, Billy Joe, 3,926,322.
Still, Leslie Ernest, to Precision Screw & Manufacturing Company Limited, The. Inserts. 3,926,356, Cl. 227-114.000.
Stillman, Neil W.: *See—*
Lieb, Donald F.; and Stillman, Neil W., 3,926,771.
Stloukal, Mojmir; Syrovatka, Zdenek; Dolezel, Milan; and Stripek, Karel, to Prvni Brnenska strojirna. Incineration of hospital refuse. 3,926,130, Cl. 110-10.000.
Stoddard, William H., Jr.: *See—*
Niedrach, Leonard W.; and Stoddard, William H., Jr., 3,926,766.
Stohr, Helmut: *See—*
Jonville, Pierre; Stohr, Helmut; Beccu, Klaus D.; and Baronnet, Rene, 3,926,674.
Stolt-Nielsen, Inc.: *See—*
De Gregorio, Paul V., 3,926,135.
Stookey, Donald J., to Monsanto Company. Stripping monomers from a slurry of copolymerized acrylonitrile. 3,926,927, Cl. 260-85.50S.
Storck, Gerhard: *See—*
Barzynski, Helmut; Marx, Matthias; Storck, Gerhard; and Saenger, Dietrich, 3,926,636.
Strachan & Henshaw Limited: *See—*
Alsop, Arthur Graham, 3,926,115.
Strahl, Walter. Sympathetic ink. 3,926,645, Cl. 106-21.000.
Strasser, Karl: *See—*
Frie, Wolfgang; Grave, Burghard; Strasser, Karl; and Gutbier, Heinrich, 3,926,676.
Straub, Otto Christian, to Bayer Aktiengesellschaft. Para-influenza-3-virus. 3,927,209, Cl. 424-89.000.
Stripek, Karel: *See—*
Stloukal, Mojmir; Syrovatka, Zdenek; Dolezel, Milan; and Stripek, Karel, 3,926,130.
Strobel, Wolfgang; Jaenicke, Ottokar; Schuddemage, Horst-Dieter; and Jastrow, Horst, to Hoechst Aktiengesellschaft. Process for the preparation impact resistant styrene polymers. 3,927,142, Cl. 260-878.00R.
Stromberg-Carlson Corporation: *See—*
Davis, Gordon H.; and Joehler, Klaus, 3,927,270.
Pommerening, Uwe A.; and Richards, Glenn L., 3,927,273.
Sturgis, Clifford M. Self-contained electric steam space heating unit. 3,927,299, Cl. 219-365.000.
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, to Sumitomo Chemical Company, Ltd. Process for separating hydroperoxides. 3,927,114, Cl. 260-610.00A.
Sugahara, Eisuke, to Nippon Piston Ring Co., Ltd. Resonance preventive system for power transmission systems of internal combustion engines. 3,926,074, Cl. 74-857.000.
Sugai, Tetuya; Soga, Hiromu; Motegi, Masayosi; and Kanno, Hideo, to Nippon Steel Corporation. Control system for computer use for on-line control. 3,927,394, Cl. 340-172.500.
Suggitt, Robert M.; and Crone, John M., Jr., to Texaco Inc. Method of regenerating spent hydroalkylation catalyst containing an oxidizable group VIII metal. 3,926,842, Cl. 252-411.00R.
Suggitt, Robert M.; and Odle, John D., to Texaco Inc. Preparation of hydrocarbons. 3,927,135, Cl. 260-672.00R.
Suggitt, Robert M.; and Odle, John D., to Texaco Inc. Treatment of hydrocarbons. 3,927,136, Cl. 260-672.00R.
Sugio, Akitoshi: *See—*
Yoshikawa, Yoshio; Sugio, Akitoshi; Kato, Tomotake; and Okazaki, Heizo, 3,927,190.
Sugizaki, Atsushi; Hirose, Takeshi; Yokota, Yukio; Okumura, Akio; Oishi, Yasushi; and Arai, Atsuaki, to Fuji Photo Film Co., Ltd. Color silver halide photographic materials containing couplers having an oleophilic group. 3,926,634, Cl. 96-100.000.
Suhren, Glen D.; and True, Charles W., III, to United States of America, Air Force. Zero crossing SCR light dimmer. 3,927,349, Cl. 315-205.000.
Sullivan, Daniel W.: *See—*
Dunlap, Peter; and Sullivan, Daniel W., 3,926,107.
Sullivan, Lyle L., to Olean Case Corporation. Tool carrying case. 3,926,308, Cl. 206-223.000.
Sulzer Brothers Limited: *See—*
Grochol, Jan; and Meier, Werner, 3,927,165.
Vogeli, Ernst, 3,926,408.
Sumitomo Chemical Company, Ltd.: *See—*
Fukuba, Kozo; Ogushi, Yasutomo; and Miyazaki, Minematsu, 3,926,990.
Ishizumi, Kikuo; Mori, Kazuo; Yamamoto, Michihiro; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 3,926,993.
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,927,114.
Tobiki, Hisao; Okamoto, Tadashi; and Akiyama, Hisao, 3,927,054.
Sumitomo Electric Industries, Ltd.: *See—*
Hayashi, Makoto; Hinata, Masanori; Yokota, Minoru; and Kondo, Takasi, 3,926,023.
Sumitomo Metal Industries Ltd.: *See—*
Kowaka, Masamichi; and Fujikawa, Hisao, 3,926,620.
Shima, Seisuke, 3,926,127.
Summers, Robert S.; and Summers, William R. Bevel and ring gear drive. 3,926,065, Cl. 74-424.000.
Summers, William A.; Christy, Betty L.; and Sweeney, Joseph V., to Ebasco Services Incorporated. Monitor and results computer system. 3,927,308, Cl. 235-151.300.
Summers, William R.: *See—*
Summers, Robert S.; and Summers, William R., 3,926,065.
Sun Chemical Corporation: *See—*
Rosen, George; Carlick, Daniel J.; and Reiter, Ralph H., 3,926,638.
Rosen, George; Carlick, Daniel J.; and Reiter, Ralph H., 3,926,639.
Rosen, George, 3,926,640.
Rosen, George, 3,926,641.
Sunbeam Corporation: *See—*
Muehlhausen, Herbert N.; and Unger, John J., 3,926,350.
Sund, Joseph Tat-Hin, to Bell & Howell Co. Typing sheet for thermal duplicating processes. 3,927,237, Cl. 428-325.000.
Sundby, Bjorn, to Colgate-Palmolive Company. Esters of dicarboxylic acids and polyhydroxy tertiary amines as new detergent softener compounds. 3,927,073, Cl. 260-485.00G.
Sussmann, Erhard, to Siemens Aktiengesellschaft. Method of epitactic precipitation of inorganic material. 3,926,715, Cl. 156-612.000.
Suzuki, Hirofumi, to Hitachi, Ltd. Imaging target for photoconduction type image pickup device. 3,927,340, Cl. 313-371.000.
Suzuki, Masatoshi: *See—*
Enokido, Nobuo; Murakami, Atsushi; Yamaguchi, Kazuo; Kanoh, Natsuki; Tanaka, Toru; Okano, Shigeaki; and Suzuki, Masatoshi, 3,926,929.
Suzuki, Sachio: *See—*
Aishima, Itsuho; Kitaoka, Atsushi; Koseki, Toshinori; Suzuki, Sachio; Arimoto, Kenji; and Matsumoto, Koichi, 3,926,873.
Suzuki, Takehiko: *See—*
Ono, Tetsuji; Nakanishi, Yoshiyuki; Suzuki, Takehiko; and Okuda, Yukio, 3,926,846.
Svantner, Jiri: *See—*
Kotulak, Ludovit; and Svantner, Jiri, 3,926,563.
Svenska Entreprenad AB Sentab: *See—*
Backstrom, Arne L., 3,925,992.
Svirschevsky, Valentin Konstantinovich; Orekhov, Anatoly Alexandrovich; Tregubov, Boris Grigorievich; and Trofimuk, Andrei Alexeevich. Device for driving holes in the ground. 3,926,267, Cl. 175-19.000.

Swanson, Sydney Alan Vasey: *See—*
Freeman, Michael Alexander Reykers; and Swanson, Sydney Alan Vasey, 3,925,824.

Swartz, Michael Lawrence: *See—*
Lee, Henry Lawrence, II; Smith, Francis Fabian; and Swartz, Michael Lawrence, 3,926,906.

Sweeney, Joseph V.: *See—*
Summers, William A.; Christy, Betty L.; and Sweeney, Joseph V., 3,927,308.

Sweeney, William A., to Chevron Research Company. Sultone extraction process. 3,927,028, Cl. 260-327.00S.

Swinkels, Augustinus Petrus Jozephus: *See—*
Harmsen, Jan Willem; and Swinkels, Augustinus Petrus Jozephus, 3,926,508.

Switchcraft, Inc.: *See—*
Bailey, James R.; and Lavigne, Vernon W., 3,926,499.

Synestructics, Inc.: *See—*
Pearce, Peter J., 3,925,941.

Syntex (U.S.A.) Inc.: *See—*
Kracklauer, John J., 3,926,881.

Synvar Associates: *See—*
Becher, Jan; and Ullman, Edwin F., 3,927,019.

Syrmopoulos, Demosthenes S.: *See—*
Cohen, Norman R.; and Syrmopoulos, Demosthenes S., 3,926,816.

Syrovatka, Rudolf: *See—*
Habasko, Werner; and Syrovatka, Rudolf, 3,926,841.

Syrovatka, Zdenek: *See—*
Stloukal, Mojmir; Syrovatka, Zdenek; Dolezel, Milan; and Stripek, Karel, 3,926,130.

Sytina, Evgenia Nikolaevna: *See—*
Grinev, Alexei Nikolaevich; Shvedov, Vasily Ivanovich; Sytina, Evgenia Nikolaevna; Bogdanova, Nadezhda Sergeevna; Nikolaeva, Irina Sergeevna; Pershin, Grigory Nikolaevich; and Guskova, Tatyana Anatolievna, 3,927,125.

Szabo, Karoly. M-(3,3-disubstituted ureido) phenyl [(substituted)-methyl] carbamates. 3,927,070, Cl. 260-479.00C.

Szente, Andre: *See—*
Hellerbach, Joseph; and Szente, Andre, 3,927,010.

Szumacher, Boleslaw. Cork puller. 3,926,076, Cl. 81-3.410.

Tahiliani, Vasu H.; and Graybill, Howard W., to I-T-E Imperial Corporation. Three-phase cable termination for metal enclosed compressed gas-insulated substation. 3,927,246, Cl. 174-19.000.

Tainsh, Thomas R. Collapsible bow and arrow stand. 3,926,393, Cl. 248-165.000.

Tajima, Shigenobu: *See—*
Koyanagi, Shunichi; Arai, Shigeru; Tajima, Shigenobu; and Kurimoto, Kazuhiko, 3,926,931.

Takabatake, Mitsuo; and Tsuji, Kikuo, to Asahi Glass Company, Ltd. Method of forming refractory oxide coatings. 3,927,223, Cl. 427-34.000.

Takacs, Kalman: *See—*
Korbonits, Dezso; Harsanyi, Kalman; Molnar nee Bako, Erzsebet; Takacs, Kalman; Heja, Gergely; Bodnar, Janos; Bodrogi, Istvan; and Erodi, Judit, 3,927,025.

Takada, Juichiro, legalized authorized heir: *See—*
Takada, Takezo, deceased; and Takada, Juichiro, legalized authorized heir, 3,926,227.

Takada, Takezo, deceased; and by Takada, Juichiro, legalized authorized heir, to Takata Kojyo Co., Ltd. Load sensitive belt. 3,926,227, Cl. 139-383.00R.

Takahashi, Yasuo; and Oishi, Michiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Large aperture semi-wide angle lens. 3,926,503, Cl. 350-215.000.

Takahata, Kouichi: *See—*
Kimura, Shuji; and Takahata, Kouichi, 3,927,413.

Takamizawa, Minoru; Shinohara, Toshio; and Takita, Masatoshi, to Shinetsu Chemical Company. Method for the preparation of organosilylamines. 3,927,057, Cl. 260-448.20E.

Takata Kojyo Co., Ltd.: *See—*
Takada, Takezo, deceased; and Takada, Juichiro, legalized authorized heir, 3,926,227.

Takayama, Kenichiro; Adachi, Tetsuo; Kohata, Mamoru; Hattori, Kiyoji; and Tomiyama, Tomoko, to Kyowa Hakko Kogyo Co., Ltd. Process for the production of citric acid. 3,926,724, Cl. 195-28.00R.

Takeda Chemical Industries, Ltd.: *See—*
Aibe, Toshio; Mochida, Seiji; and Itoga, Kiyoshi, 3,926,590.
Kanzaki, Toshihiko; Fujisawa, Yukio; Shirafuji, Hideo; Nara, Kiyoshi; and Yoneda, Masahiko, 3,926,729.
Kuwada, Yutaka; Meguro, Kanji; and Tawada, Hiroyuki, 3,927,015.
Nara, Kiyoshi; Ohta, Kazuhiko; Katamoto, Kazuyoshi; Mizokami, Nariakira; and Fukuda, Hideo, 3,926,973.
Ohno, Yoshitomo; Takigawa, Yasuko; Aoki, Katsuo; and Yashiki, Takatsuka, 3,927,205.

Takezawa, Teruhiro: *See—*
Yoshino, Takehiko; Yanagimachi, Akio; Uehara, Takashi; Takezawa, Teruhiro; Fukuda, Masaaki; and Kayano, Tatsuo, 3,927,269.

Takigawa, Yasuko: *See—*
Ohno, Yoshitomo; Takigawa, Yasuko; Aoki, Katsuo; and Yashiki, Takatsuka, 3,927,205.

Takita, Masatoshi: *See—*
Takamizawa, Minoru; Shinohara, Toshio; and Takita, Masatoshi, 3,927,057.

Talarico, Orlando N.: *See—*
Johnson, Clarence R.; Kidder, Jay T.; and Talarico, Orlando N., 3,925,834.

Tamai, Yasuo: *See—*
Honjo, Satoru; Tamai, Yasuo; and Tsuji, obuo, 3,926,825.

Tanabe Seiyaku Co., Ltd.: *See—*
Chibata, Ichiro; Ito, Hiroshi; Morimoto, Tomoaki; Taniguchi, Yukio; and Fujimoto, Tsuneo, 3,926,733.

Tanaka, Eiichiro; Nishimura, Katsuo; Shimizu, Hiroshi; and Koshi, Masao, to Citizen Watch Co., Ltd. Liquid-crystal display cell and method of making same. 3,926,502, Cl. 350-160.0LC.

Tanaka, Hiroshi; and Morita, Isao, to Caterpillar Mitsubshi Ltd. Emergency braking system. 3,926,282, Cl. 188-106.00F.

Tanaka, Hiroshi: *See—*
Izumi, Sumio; and Tanaka, Hiroshi, 3,926,791.

Tanaka, Kunihiko: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,927,114.

Tanaka, Mitsuru: *See—*
Shibata, Yutaka; Kodera, Yoshiaki; Tanaka, Mitsuru; Kamiyama, Fumio; and Nakatan, 3,926,918.

Tanaka, Motomu: *See—*
Nose, Shinji; Tokuda, Shingo; Tanaka, Motomu; and Tsujimura, Hideaki, 3,926,905.

Tanaka, Toru: *See—*
Enokido, Nobuo; Murakami, Atsushi; Yamaguchi, Kazuo; Kanoh, Natsuki; Tanaka, Toru; Okano, Shigeaki; and Suzuki, Masatoshi, 3,926,929.

Tanguy, Pierre, to Etud. Ice-box. 3,926,414, Cl. 259-108.000.

Taniguchi, Yukio: *See—*
Chibata, Ichiro; Ito, Hiroshi; Morimoto, Tomoaki; Taniguchi, Yukio; and Fujimoto, Tsuneo, 3,926,733.

Tanimoto, Kenji: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,927,114.

Taniuchi, Osami: *See—*
Kinoshita, Minoru; and Taniuchi, Osami, 3,927,417.

Tarhan, Mehmet Orhan, to Bethlehem Steel Corporation. Process for direct cooling of corrosive industrial cases. 3,927,153, Cl. 261-128.000.

Tate & Lyle Limited: *See—*
Rundell, John Trethowan; and Pottage, Paul Richmond, 3,926,662.

Tausanovitch, Dausan: *See—*
Lovisa, Peter R.; and Tausanovitch, Dusan, 3,926,404.

Tausanovitch, Dusan: *See—*
Lovisa, Peter R.; and Tausanovitch, Dusan, 3,926,404.

Tawada, Hiroyuki: *See—*
Kuwada, Yutaka; Meguro, Kanji; and Tawada, Hiroyuki, 3,927,015.

Taylor, Dale F.; and Siwek, Erwin G., to General Electric Company. Lead-acid storage battery paste. 3,926,670, Cl. 136-26.000.

Taylor, Glenn N., to Colgate-Palmolive Company. Selectively positionable diaper assembly. 3,926,189, Cl. 128-287.000.

Taylor Industries, Inc.: *See—*
Taylor, Philip W., 3,926,141.

Taylor, Philip W., to Taylor Industries, Inc. Modular wire guard. 3,926,141, Cl. 116-114.00R.

Taylor, Scott V. E. Hydraulic transmission. 3,926,287, Cl. 192-61.000.

Taylor, William I.: *See—*
Hall, John B.; Lala, Lekhu Kewalram; Beets, Muus G. J.; and Taylor, William I., 3,927,083.

Teare, Melvin John: *See—*
Fjarlie, Earl John; Doyle, Thomas; and Teare, Melvin John, 3,927,383.

Technifil S.A.: *See—*
Beretta, Oscar, 3,926,412.

Tecumseh Products Company: *See—*
Hannibal, Billy B., 3,926,281.

Tegtmeier, Sheldon D., to Tegtmeier & Sons, Inc. Lifting jack. 3,926,411, Cl. 254-89.00R.

Tegtmeier & Sons, Inc.: *See—*
Tegtmeier, Sheldon D., 3,926,411.

Teledyne Ryan Aeronautical a Division of Teledyne Industries, Inc.: *See—*
Long, Roger A., 3,926,708.

Telefonaktiebolaget L M Ericsson: *See—*
Fjallbrant, Tore Torstensson, 3,927,378.

Teletype Corporation: *See—*
Denley, Ronald S., 3,927,290.

Teller, Daniel M.; Sellstedt, John H.; and Guinosso, Charles J., to American Home Products Corporation. 7-[2-(2-Thioxo-4-thiazolin-3-yl)-acetamido] cephalosporanic acid derivatives. 3,926,984, Cl. 260-243.00C.

Tendler, Robert Kanof. Wall hanger. 3,926,399, Cl. 248-467.000.

Tenneco Chemicals, Inc.: *See—*
Turnbo, Roy Glen; and Keyworth, Donald A., 3,927,176.

Tenneco Inc.: *See—*
Worden, Donald P., 3,927,292.

Terasaki, Shuji: *See—*
Yoshikawa, Shinsuke; Endo, Hiroyuki; and Terasaki, Shuji, 3,927,156.

Termin, Erich: *See—*
Ismail, Roshdy; Lenz, Arnold; and Termin, Erich, 3,927,151.

Ternowski, Robert H.: *See—*
Mitchell, Daniel M.; and Ternowski, Robert H., 3,927,363.
Teuber, Roland E.; Pearson, John L.; and Brown, Charles D., to United States of America, Army. Control valve logic. 3,926,390, Cl. 249-3.220.
Texaco Inc.: *See—*
Chiou, Jackson K. S.; and Jones, Ronald E., 3,927,102.
Coleman, Richard L.; Cummins, Billy H.; and Ashton, William B., 3,926,786.
Cummings, William M., 3,926,578.
Duranleau, Roger G.; and Larkin, John M., 3,927,050.
Duranleau, Roger George; and Love, Richard F., 3,927,048.
Kablaoui, Mahmoud S.; and Duranleau, Roger G., 3,927,049.
McCall, Richard H., 3,926,256.
McCoy, Frederic C.; and Cole, Edward L., 3,926,839.
Miller, Edward F.; and Hellmuth, Walter W., 3,927,104.
Suggitt, Robert M.; and Crone, John M., Jr., 3,926,842.
Suggitt, Robert M.; and Odle, John D., 3,927,135.
Suggitt, Robert M.; and Odle, John D., 3,927,136.
Wilson, Raymond F.; Peck, Reese A.; Estes, John H.; and Brandenburg, John T., 3,926,779.
Texas Instruments Incorporated: *See—*
Sexton, Peter, 3,926,573.
Texmark, Incorporated: *See—*
Filsinger, John F.; and Mueller, Roger P., 3,926,109.
Textron Inc.: *See—*
Reschak, Robert J., 3,927,307.
Thaeler, Bruce K., 3,925,858.
Thaeler, Bruce K., to Textron Inc. Adhesively securable slide fastener. 3,925,858, Cl. 24-205.16D.
Theisen, Gunter, to Oberschwabische Metallwarenfabrik GmbH & Co. K.G. Aluminium enamels. 3,927,243, Cl. 428-433.000.
Thermo Electron Corporation: *See—*
Bornhorst, Walter J.; Coleman, Steven J.; and O'Brien, James W., 3,926,196.
Thettu, Raghulinga R., to Xerox Corporation. Contact arc replication device. 3,926,058, Cl. 73-432.00R.
Theurer, Josef: *See—*
Plasser, Franz, deceased; Plasser, Erna, heir; Theurer, Josef; Schubert, Egon; and Riessberger, Klaus, 3,926,123.
Thomas, Andreas M. J.: *See—*
van de Moesdijk, Cornelis G. M.; and Thomas, Andreas M. J., 3,927,108.
Thomas, David G.; Mixon, William R.; and Hayes, Phil H., to United States of America, Interior. Support for dynamic membrane. 3,926,799, Cl. 210-23.000.
Thomas, Jean Pierre Francis: *See—*
Humbert, Jean Jacques; Thomas, Jean Pierre Francis; Brut, Gerard Yvan; and Gounou, Jean Marie Joseph Elie, 3,926,697.
Thomas, Leonard L. Tobacco smoke filter. 3,926,199, Cl. 131-187.000.
Thomas, Samuel Charles, Jr.; and Cease, Vincent Jay, to Continental Oil Company. Purification of crude sulfonic acids. 3,927,081, Cl. 260-505.00P.
Thompson, Fredrick W., to United States of America, Air Force. Method of making tension indicator-turnbuckle. 3,925,869, Cl. 29-175.000.
Thompson, Kenneth F.: *See—*
Roth, Clarence Edward, Jr.; Hughes, Robert L.; and Thompson, Kenneth F., 3,927,245.
Thompson, Marion E., to Maytronics, Inc. Audio responsive light display system. 3,927,402, Cl. 340-366.00B.
Thomson-CSF: *See—*
Poinsard, Henri; and Lemoing, Jean, 3,927,405.
Thor Power Tool Company: *See—*
Bardwell, Francis G.; and Dudek, Edmund C., 3,926,264.
Thorpe, Merle L. Burner system. 3,926,544, Cl. 431-114.000.
Thrasher, George E., to Master Pneumatic-Detroit, Inc. Lubricating apparatus. 3,926,279, Cl. 184-29.000.
TIE/communications, Inc.: *See—*
Kunimine, Isao, 3,927,283.
Tsutsumi, Fumio; and Kerman, Stephen, 3,927,278.
Tillner, Alfred, to Oke Rainer von der Heyde & Co. Upholstery fastening device. 3,925,861, Cl. 24-243.00K.
Tilt-A-Bed Corporation, The: *See—*
Johnson, Clarence R.; Kidder, Jay T.; and Talarico, Orlando N., 3,925,834.
Timmons, Frank E., to Belden Corporation. Shielded coaxial cable. 3,927,247, Cl. 174-36.000.
Tinsley, Samuel W.: *See—*
Rick, Edward A.; and Tinsley, Samuel W., 3,927,116.
Tobiki, Hisao; Okamoto, Tadashi; and Akiyama, Hisao, to Sumitomo Chemical Company, Ltd. Process for producing β-phenylserine copper complex. 3,927,054, Cl. 260-438.100.
Todd, Donald A., to Western Acadia, Incorporated. Silicone catheter and process for manufacturing same. 3,926,705, Cl. 156-155.000.
Tokuda, Shingo: *See—*
Nose, Shinji; Tokuda, Shingo; Tanaka, Motomu; and Tsujimura, Hideaki, 3,926,905.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Ichinose, Noboru; Yokomizo, Yuhji; and Katsura, Masaki, 3,926,858.
Kodama, Koji; and Kasai, Yujiro, 3,927,365.
Toland, William g.: *See—*
Lapporte, Seymour J.; and Toland, William g., 3,927,078.
Tolstikov, Genrikh Alexandrovich: *See—*
Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovidh; Zakharova, Nina Vasilievna; Golubenko, Mikhail Afanasievich; Tolstikov, Genrikh Alexandrovich; Kholodovskaya, Rakhil Samoilovna; Shalimova, Zoya Stepanovna; Legostaeva, Taisia Vasilievna; Popov, Vasily Dmitrievich; and Dolidze, Vladimir Romanovich, 3,927,038.
Tomikawa, Masami; Ohkawa, Hideo; and Tsunoda, Akiji, to Idemitsu Kosan Company Limited. Method of forming a dimensionally accurate foamed polyethylene resin products. 3,927,159, Cl. 264-45.300.
Tomiyama, Tomoko: *See—*
Takayama, Kenichiro; Adachi, Tetsuo; Kohata, Mamoru; Hattori, Kiyoji; and Tomiyama, Tomoko, 3,926,724.
Tomlin, Clive Dudley Spencer; Barlow, Charles Brian; and White, Brian Graham, to Imperial Chemical Industries Limited. 4-Arylaminopyridine herbicides. 3,926,611, Cl. 71-94.000.
Tomlinson, Kenneth: *See—*
Smith, Brian Robson; and Tomlinson, Kenneth, 3,926,829.
Tomoda, Sadamichi; and Nagao, Nobuo, to Chiba Fine Chemical Co. Ltd. Method for pelletizing compositions comprising a non-crystalline olefinic polymer or copolymer, and a surfactant. 3,927,166, Cl. 264-144.000.
Toriumi, Shiro; and Yamagishi, Seiichi, to Minolta Camera Kabushiki Kaisha. Sheet insertion and removing device. 3,926,426, Cl. 271-3.000.
Torrani, Roberto: *See—*
De Santis, Sergio; Farello, Giovanni; and Torrani, Roberto, 3,926,354.
Toth, Anton: *See—*
Zengel, Hans-Georg; Toth, Anton; Magerlein, Helmut; and Meyer, Gerhard, 3,927,085.
Touval, Irving, to M&T Chemicals Inc. Flame retardant compositions. 3,926,883, Cl. 260-28.50A.
Toyo Boseki Kabushiki Kaisha: *See—*
Moriyama, Kazuo; Iwato, Takashi; and Ohno, Morihiko, 3,926,548.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Yanagihara, Tadahisa; and Fukahori, Kentaro, 3,927,134.
Toyoda-Koki Kabushiki-Kaisha: *See—*
Kikuchi, Makoto, 3,925,878.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Niimi, Itaru; Kaneko, Yasuhisa; Noda, Fumiyoshi; and Tsuzuki, Yoshihiro, 3,927,181.
Shibatani, Juichi; and Kondo, Toshiyuki, 3,926,480.
Tozawa, Minoru, to Mitsubishi Denki Kabushiki Kaisha. Cartridge tape player. 3,927,419, Cl. 360-94.000.
Trebilcock, Lionel F. Stacking aid. 3,926,321, Cl. 214-10.50R.
Tregubov, Boris Grigorievich: *See—*
Svirschevsky, Valentin Konstantinovich; Orekhov, Anatoly Alexandrovich; Tregubov, Boris Grigorievich; and Trofimuk, Andrei Alexeevich, 3,926,267.
Tremblay, Paul Albert: *See—*
Der Marderosian, Dikran; and Tremblay, Paul Albert, 3,926,714.
Treuner, Uwe D.; and Breuer, Hermann, to E. R. Squibb & Sons, Inc. Dithiocarbonylthioacetyl cephalosporins. 3,926,979, Cl. 260-243.00C.
Treuner, Uwe D.; and Breuer, Hermann, to E. R. Squibb & Sons, Inc. Dithiocarbonylthioacetyl cephalosporins. 3,926,980, Cl. 260-243.00C.
Treuner, Uwe D.; and Breuer, Hermann, to E. R. Squibb & Sons, Inc. 3-Heterothio[(alkoxycarbonyl)thioacetyl]cephalosporanic derivatives. 3,926,983, Cl. 260-243.00C.
Tricot, Roland: *See—*
Gueussier, Andre; Tricot, Roland; and Lefevre, Jean, 3,926,685.
Trifunovic, Alexander L.; Hills, William H.; Borgman, Milton H.; and Mersereau, Emory P., to Indian Head, Inc. Method and apparatus for texturing continuous filament yarn. 3,925,976, Cl. 57-140.00R.
Triprint Pty. Ltd.: *See—*
Milligan, Donald Dunn, 3,926,117.
Trisoglio, Giovanni: *See—*
De Nora, Oronzio; Bianchi, Giuseppe; Nidola, Antonio; and Trisoglio, Giovanni, 3,926,751.
Tritsch, Ludwig, to Johnson & Johnson. Disposable diaper with twist tab fastener. 3,926,190, Cl. 128-287.000.
Tritsch, Ludwig, to Johnson & Johnson. Disposable diaper having adhesive tabs and release strips therefor permanently attached at marginal edges of diaper. 3,926,191, Cl. 128-287.000.
Trofimuk, Andrei Alexeevich: *See—*
Svirschevsky, Valentin Konstantinovich; Orekhov, Anatoly Alexandrovich; Tregubov, Boris Grigorievich; and Trofimuk, Andrei Alexeevich, 3,926,267.
True, Charles W., III: *See—*
Suhren, Glen D.; and True, Charles W., III, 3,927,349.
TRW Inc.: *See—*
Curtis, Donald A., 3,925,876.
Jones, Robert J.; and Cassey, Howard N., 3,926,913.
Jones, Robert J.; and Green, Howard E., 3,927,027.
Meyers, Robert A., 3,926,575.
Tsuchida, Takashi; Shinoda, Kenichi; Yamamoto, Kohei; Murata, Tomoya; and Maeda, Yoshihiro, to Fuji Electrochemical Co., Ltd. Method of manufacturing fuel cell electrodes. 3,926,678, Cl. 136-122.000.
Tsuda, Katsuhisa: *See—*
Horio, Takehiro; Tsuda, Katsuhisa; Imai, Tadashi; Mitsutsuka, Masashi; and Morise, Heiji, 3,926,417.

Tsugukuni, Hideyoshi; Kano, Masafumi; and Matsuda, Mitsuhiro, to Dai Nippon Toryo Co. Ltd. Thermosetting polymer dispersions and process for production thereof. 3,926,875, Cl. 260-23.0TN.
Tsuji, Kikuo: *See—*
Takabatake, Mitsuo; and Tsuji, Kikuo, 3,927,223.
Tsuji, obuo: *See—*
Honjo, Satoru; Tamai, Yasuo; and Tsuji, obuo, 3,926,825.
Tsujimura, Hideaki: *See—*
Nose, Shinji; Tokuda, Shingo; Tanaka, Motomu; and Tsujimura, Hideaki, 3,926,905.
Tsunoda, Akiji: *See—*
Tomikawa, Masami; Ohkawa, Hideo; and Tsunoda, Akiji, 3,927,159.
Tsuruoka, Takashi; Niwa, Tomizo; Shibata, Uichi; Inouye, Shigeharu; and Niida, Taro, to Meiji Seika Company Ltd. D-glucaro-1,5-lactam derivatives. 3,927,001, Cl. 260-293.860.
Tsuruzawa, Teruya; and Ueda, Muneyuki. Cleaning brush device. 3,925,843, Cl. 15-184.000.
Tsutsumi, Fumio; and Kerman, Stephen, to Nippon Tsu Shin Kogyo K.K.; and TIE/communications, Inc. Direct-station-selection intercommunication and automatic holding circuit in a key telephone system. 3,927,278, Cl. 179-99.000.
Tsuzuki, Yoshihiro: *See—*
Niimi, Itaru; Kaneko, Yasuhisa; Noda, Fumiyoshi; and Tsuzuki, Yoshihiro, 3,927,181.
Tu, Robert S.: *See—*
Kliment, Karel; and Tu, Robert S., 3,925,895.
Tucker, John L.; and Spector, George. Fishing sinker. 3,925,921, Cl. 43-43.120.
Tucker, Robert E.: *See—*
Silver, Edward S.; and Tucker, Robert E., 3,926,513.
Tucker, Robert Jerome, to American Cyanamid Company. Infrared transmitting filter containing 1,4,5,8-tetracyclohexylaminoanthraquinone. 3,926,835, Cl. 252-300.000.
Turk, Chester Frank: *See—*
Krapcho, John; and Turk, Chester Frank, 3,926,968.
Krapcho, John; and Turk, Chester Frank, 3,926,988.
Turnbo, Roy Glen; and Keyworth, Donald A., to Tenneco Chemicals, Inc. Process for the removal of water from gas streams. 3,927,176, Cl. 423-210.000.
Turner, Thomas M.; and Scheid, Charles H., to Ellicott Machine Corporation. Method and apparatus for determining solids delivered from moving slurry. 3,926,050, Cl. 73-205.00D.
Tygenhof, Charles. Pressurized can piercing tool. 3,926,340, Cl. 222-83.500.
Tyler Holding Company: *See—*
Hurst, Gerald L.; and Machacek, Oldrich, 3,926,119.
U, Aung San, to International Telephone and Telegraph Corporation. Etched silicon washed emitter process. 3,926,695, Cl. 148-187.000.
Uebelhart, Heinrich; Schmid, Erich; and Wyser, Paul, to Renata A.G. Device for the digital indication of the accuracy of a mechanical clockwork. 3,926,048, Cl. 73-6.000.
Ueda, Muneyuki: *See—*
Tsuruzawa, Teruya; and Ueda, Muneyuki, 3,925,843.
Ueda, Yuji: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,927,114.
Uehara, Takashi: *See—*
Yoshino, Takehiko; Yanagimachi, Akio; Uehara, Takashi; Takezawa, Teruhiro; Fukuda, Masaaki; and Kayano, Tatsuo, 3,927,269.
Ule, Louis A.: *See—*
Michelson, Gunnar P.; and Ule, Louis A., 3,926,159.
Ulics, George, to Ford Motor Company. Cab roof to bottom of compartment seal. 3,926,469, Cl. 296-23.00R.
Ullman, Edwin F.: *See—*
Becher, Jan; and Ullman, Edwin F., 3,927,019.
Unangst, Paul H.: *See—*
Hall, Garth O.; and Unangst, Paul H., 3,926,396.
Underwood, William George Elphinstone: *See—*
Barton, Derek Harold Richard; Underwood, William George Elphinstone; Looker, Brian Edgar; and Hewitt, Graham, 3,927,013.
Unger, John J.: *See—*
Muehlhausen, Herbert N.; and Unger, John J., 3,926,350.
Unglaube, Uwe: *See—*
Wefers, Norbert; Militz, Uwe; Unglaube, Uwe; and Schwarzkopf, Joachim, 3,927,303.
Union Carbide Canada Limited: *See—*
Gaeckel, Bruno L.; and Larsen, Hans R., 3,927,145.
Union Carbide Corporation: *See—*
Rick, Edward A.; and Tinsley, Samuel W., 3,927,116.
Vahldieck, Nathan P., 3,926,794.
Union Oil Company of California: *See—*
Ward, John W., 3,926,780.
Uniroyal, Inc.: *See—*
Batorewicz, Wadim, 3,927,146.
Cantor, Stephen E., 3,926,703.
Cantor, Stephen E.; and Brett, Thomas J., Jr., 3,927,067.
Fuest, Ronald W., 3,926,553.
United Kingdom Atomic Energy Authority: *See—*
Hosegood, Samuel Brittan, 3,926,720.
Matkin, Derek Ivan; Cavell, Ian William; and Dyson, John Raymond, 3,926,857.
United States Gypsum Company: *See—*
Balinski, Henry A.; and Kuhr, Albert F., 3,925,946.
United States Lines, Inc.: *See—*
Bjelland, Ronald W.; Narwicz, Charles A.; and Hetmanski, Casimir, 3,926,331.
United States of America
Agriculture: *See—*
Baker, Roy V., 3,926,057.
Griffin, Anselm C., Jr.; and Watson, Harold, 3,925,849.
Harrell, Edsel A.; Hare, Woodrow W.; and Young, John R., 3,926,371.
Harris, James A.; and Arthur, Jett C., Jr., 3,926,550.
Mares, Trinidad; and Arthur, Jett Clinton, 3,926,549.
Otey, Felix H.; Westhoff, Richard P.; and Mehltretter, Charles L., 3,926,868.
Reine, Alden H.; Arthur, Jett C., Jr.; and Portnoy, Norman A., 3,926,555.
Ward, Truman L.; Benerito, Ruth R.; and Hebert, Jacques J., 3,926,709.
Air Force: *See—*
Abson, David J.; and Gurney, Ferdinand J., 3,926,029.
Atkinson, Lester M.; Bigham, Carroll R.; and Peed, James L., 3,925,956.
D'Anna, Ronald F.; and Llewellyn, Richard E., 3,927,310.
Dryden, Eugene H., 3,927,258.
Gross, Robert A., 3,925,990.
Kaufman, Irving, 3,926,520.
LaBotz, Richard J., 3,925,983.
Otten, Leonard J., III, 3,926,046.
Stahmann, James R.; and Kalakowsky, Charles B., 3,926,386.
Suhren, Glen D.; and True, Charles W., III, 3,927,349.
Thompson, Fredrick W., 3,925,869.
Viets, Hermann, 3,926,373.
Army: *See—*
Dickinson, Warren D., 3,927,312.
McCracken, Robert H., 3,926,121.
Teuber, Roland E.; Pearson, John L.; and Brown, Charles D., 3,926,390.
Williams, David; and Lucey, George K., Jr., 3,926,120.
Wolterman, William G., 3,926,122.
Woods, Robert L., 3,926,221.
Energy Research and Development Administration: *See—*
Bamberger, Carlos E.; and Richardson, Donald M., 3,927,192.
Bradley, Ronnie A.; Miller, William H.; and Sease, John D., 3,926,344.
Coburn, Michael D.; and Benziger, Theodore M., 3,926,953.
Gentry, William O., 3,926,560.
Hungate, Frank Porter; Riemath, William Frederic; and Bunnell, Lee Roy, 3,927,325.
Moyers, Steven M., 3,925,874.
Environmental Protection Agency: *See—*
Cywin, Allen, 3,926,743.
General Counsel-Code GP: *See—*
Pitts, David E., 3,927,227.
Schmidt, Richard F., 3,927,408.
Schuller, Frederick T.; and Moore, Warren A., 3,926,482.
Interior: *See—*
Cadotte, John E., 3,926,798.
Thomas, David G.; Mixon, William R.; and Hayes, Phil H., 3,926,799.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Auer, Siegfried O. Micrometeoroid velocity and trajectory analyzer. 3,927,324, Cl. 250-336.000.
Phillips, Wayne M. Cermet composition and method of fabrication. 3,926,567, Cl. 29-182.500.
Navy: *See—*
Andreotti, John R., 3,926,522.
Bond, James W.; and Speiser, Jeffrey M., 3,926,367.
Brown, Neil L., 3,926,056.
Cantrell, Ben H., 3,927,391.
Hammond, Peter R., 3,927,033.
Howe, David G., 3,926,684.
Johnson, Norman F., 3,926,137.
Koloc, Paul M., 3,927,323.
Kupferman, Zelig, 3,925,823.
Medrano, Alfred M., 3,927,388.
Murch, Robert M., 3,927,147.
Seib, James N.; and Willis, Harry G., 3,926,594.
Williams, Frederick W.; and Sheinson, Ronald S., 3,926,562.
Tennessee Valley Authority and the Environmental Protection Agency: *See—*
Jordan, John E.; and Newcombe, George M., 3,927,178.
U. S. Philips Corporation: *See—*
Beijer, Louis Benjamin; Driessen, Antonius Jozephus Gerardus Cornelis; and Jacobs, Cornelis Adrianus Joannes, 3,927,343.
Bermas, Gunnar Valfrid, 3,927,327.
Harmsen, Jan Willem; and Swinkels, Augustinus Petrus Jozephus, 3,926,508.
Janssens, Abraham, 3,927,373.
Lebailly, Jacques, 3,927,344.
Le Can, Claude Jan Principe Frederic, 3,927,396.
Plesslinger, Gertraud Agnes Anna; Berthold, Frank; and Roeder, Erwin, 3,926,603.

United States Steel Corporation: *See*—
Brendlinger, Edward C.; Higgs, Richard F.; and Kharouf, Issa J., 3,926,767.
Hind, Robert Duncan, 3,926,406.
Ludwigson, David C., 3,926,692.

United Technologies Corporation: *See*—
Johnson, John W.; and Selleck, Robert A., 3,926,388.
Scola, Daniel A., 3,926,903.
Scola, Daniel A., 3,926,904.

Unitika Ltd.: *See*—
Nishiwaki, Hiroshi, 3,926,701.

Universal Oil Products Company: *See*—
Hall, Garth O.; and Unangst, Paul H., 3,926,396.
Hogan, Gerard T., 3,926,473.
Michalko, Edward, 3,926,849.
Vesely, Kenneth D., 3,926,855.
Wilks, Alan D.; and Youtsey, Karl J., 3,926,570.

University of Akron, The: *See*—
Farona, Michael F.; and White, James F., 3,926,950.

University of Southern California: *See*—
Whelan, James M.; and Brook, Richard J., 3,926,854.
Wittry, David B., 3,927,319.

Upjohn Company, The: *See*—
Hester, Jackson B., Jr.; and Hanze, Arthur R., deceased, 3,927,016.
Pike, John E.; and Schneider, William P., 3,927,075.

Urban Research & Development Corporation: *See*—
Powell, Orlo A., Jr.; and Roncari, Angelo J., 3,926,582.

Ushio, Masatoshi, to Glory Kogyo Kabushiki Kaisha. Coin packaging apparatus. 3,925,966, Cl. 53-212.000.

Uthemann, Wolfgang; and Hofman, Josef, to Rosenkaimer GmbH. Collapsible and tiltable umbrella. 3,926,202, Cl. 135-20.00M.

Utken, Jay; and Hauenstine, Edgar F., to P. R. Mallory & Co., Inc. Electrical switch having a movable contact rolling between stationary contacts. 3,927,288, Cl. 200-277.000.

Vahldieck, Nathan P., to Union Carbide Corporation. Warm sludge digestion with oxygen. 3,926,794, Cl. 210-5.000.

Vairel, Edmond G.; Goulay, Jean; and Choay, Jean, to Choay S.A. Urokinase preparations. 3,926,727, Cl. 195-63.000.

Valcor Engineering Corporation: *See*—
Arnold, Kurt, 3,926,405.

Valenti, Salvatore: *See*—
Fleck, Fritz; Schmid, Horst; and Valenti, Salvatore, 3,926,969.

Valint, Paul L., Jr.: *See*—
Oswald, Alexis A.; and Valint, Paul L., Jr., 3,927,148.

van Beijnen, Christianus Antonius Maria, to Reactor Centrum Nederland (Stichting). Method of manufacturing superconductors of β-tungsten structure. 3,926,683, Cl. 148-11.50R.

Van Caporali, Ronald: *See*—
Smay, Gary Lynn; Van Caporali, Ronald; and Southwick, Russell Duty, 3,926,604.

van de Moesdijk, Cornelis G. M.; and Thomas, Andreas M. J., to Stamicarbon, B.V. Process for the preparation of cycloalkanones and/or cycloalkanols. 3,927,108, Cl. 260-586.00P.

van den Broek, Albertus Joannes, to Akzona Incorporated. Novel 11,11-alkylidene steroids. 3,927,046, Cl. 260-397.300.

Van den Houte, Jozef Willy, to Agfa-Gevaert. Production of positive colour images utilizing a photographic material containing a spiropyran compound and a polyhalogen compound. 3,926,630, Cl. 96-27.00E.

van der Sterren, Martin Leonard, to Oce-van der Grinten N.V. Photoconductive belt device and electrophotographic process and apparatus utilizing the same. 3,926,625, Cl. 96-1.00R.

Vandervelden, Cornelius Keith, to Litton Industrial Products, Inc. Fluoridation apparatus. 3,926,370, Cl. 239-25.000.

Van Duynhoven, Adrianus Henricus: *See*—
Vermeulen, Geert Jan; and Van Duynhoven, Adrianus Henricus, 3,926,224.

Van Maren, Harold B. Atraumatic uterine director. 3,926,192, Cl. 128-303.00R.

Van Nederveen, Hans Bertil, to SKF Industrial Trading and Development Company B.V. Method for sealing a filled container under vacuum, and vacuum-sealed filled containers. 3,926,306, Cl. 206-84.000.

Van Tongelen, Marcel: *See*—
De Hault, Emmanuel R. E. G. Draguez Tripels; Van Tongelen, Marcel; and Debus, Henri R., 3,927,039.

Van Winsen, Friedrich H., to Daimler-Benz Aktiengesellschaft. Suspension of steerable vehicle wheels, especially front wheels of motor vehicles. 3,926,454, Cl. 280-124.00A.

Varian Associates: *See*—
Cavalear, Charles T., 3,925,883.
Farney, George K., 3,927,347.
Kase, Heino; Marshall, Edward W.; and Kirtikar, Survrat, 3,927,409.

Varker, Alan Edward: *See*—
Kelley, John Joseph; and Varker, Alan Edward, 3,926,886.

Varta Batterie AG: *See*—
Bauer, Jakob; and Krey, Winfried, 3,926,680.

Vasterling, Paul F., to HITCO. High temperature resistant products and methods for making the same. 3,927,157, Cl. 264-29.000.

VEB Kombinat Nagema: *See*—
Knopf, Werner; and Liebscher, Harald, 3,925,962.

VEB Wirkmaschinenbau Karl-Marx-Stadt: *See*—
Kurth, Harald; Laube, Dieter; and Berthold, Erich, 3,926,013.

Venables, Susan Mary; and Watson, Charles Andrew, to Lever Bros. Co. Toothpastes. 3,925,957, Cl. 53-6.000.

Ver-Con, Inc.: *See*—
Concha C, Teodosio Jose, 3,925,917.

Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See*—
Dub, Karl; and Biricz, Stefan, 3,926,346.
Riegler, Ernst; and Schmidt, Manfred, 3,926,481.

Vermeulen, Geert Jan; and Van Duynhoven, Adrianus Henricus, to Ruti-Te Strake B.V. Weft selecting, measuring and storing apparatus. 3,926,224, Cl. 139-122.00H.

Verreydt, Jan Baptist, to Agfa-Gevaert, a naamloze vennootschap. Method for deaerating a circuit for the transport of liquids. 3,926,664, Cl. 134-21.000.

Vesely, Kenneth D., to Universal Oil Products, Company. Method of catalyst manufacture. 3,926,855, Cl. 252-465.000.

Vianova-Kunstharz, A. G.: *See*—
Nordberg, Kurt, 3,926,899.

Vicra Sterile, Inc.: *See*—
Center, John L., 3,926,309.

Victory, Thomas J. Method of converting brake band end connection. 3,926,359, Cl. 228-170.000.

Vieilleribiere, Henry, to Motorola, Inc. Automotive bridge assembly. 3,927,338, Cl. 310-68.00D.

Viets, Hermann, to United States of America, Air Force. Thrust augmentation system with oscillating jet nozzles. 3,926,373, Cl. 239-265.170.

Villax, Ivan. Alkali metal polymetaphosphate complexes of doxycycline and preparation thereof. 3,927,094, Cl. 260-559.0AT.

Vincent, Melvin C. Easel. 3,926,398, Cl. 248-448.000.

Vinton, Clarence S.; and Franklin, Charles H., to Chemotronics International, Inc. Method for the preparation of carbon structures. 3,927,186, Cl. 423-447.000.

Vivant, Gilbert: *See*—
Desitter, Gerard; and Vivant, Gilbert, 3,927,231.

Vizurraga, Luis R., to Fiber Industries Inc. Catalyst. 3,927,052, Cl. 260-429.700.

Vockenhuber, Karl: *See*—
Freudenschuss, Otto, 3,926,512.

Vogelei, Robert A.: *See*—
Burns, Ronald N.; Landwehr, Dewayne A.; Schroeder, Roger H.; Vogelei, Robert A.; and Zeller, Gary P., 3,926,462.

Vogeli, Ernst, to Sulzer Brothers Ltd. Gate valve for controlling fluid flow. 3,926,408, Cl. 251-327.000.

Vogt, B. Richard: *See*—
Sowinski, Francis Alexander; and Vogt, B. Richard, 3,926,977.

Volkswagenwerk Aktiengesellschaft: *See*—
Saridakis, Nikolaus, 3,926,673.
Wenninger, Josef, 3,926,069.

Vonco Products, Inc.: *See*—
Laske, Louis Lawrence, 3,926,311.

von der Ley, Jurgen. Building block assembly. 3,925,950, Cl. 52-585.000.

Von Klipstein, Walrath: *See*—
Forster, Siegmar; and Von Klipstein, Walrath, 3,926,407.

von Langendorff, Vitmar G., to Houdaille Industries, Inc. Punching device having adjustable guide retainer. 3,926,082, Cl. 83-140.000.

von Orelli, Marcus: *See*—
Durr, Dieter; and von Orelli, Marcus, 3,927,087.

Vorih, William J., to Gates Rubber Company, The. Modulating noise produced by rotating bodies. 3,926,238, Cl. 152-209.000.

Vos, Cornelis; and Admirant, Jacobus Den, to Gist-Brocades N.V. Antibiotic MYC 8003 and process for producing same. 3,927,211, Cl. 424-122.000.

Voss, Karl Heinz. Vehicle diverting apparatus. 3,926,126, Cl. 104-130.000.

Voyer, Paul; Pitie, Jean-Marc B.; Louvet, Olivier F.; and Roche, Alain Y. Time division switching system of the "time-space-time" type. 3,927,267, Cl. 179-15.0AT.

Vrydaghs, Roger Henri: *See*—
Monbaliu, Marcel Jacob; Priem, Jan Jozef; and Vrydaghs, Roger Henri, 3,926,436.

Vuaille, Andre, to Societe Industrielle Generale de Mecanique Appliquee S.I.G.M.A. Regulating devices for the flow of fuel for internal combustion engines. 3,926,164, Cl. 123-140.0FG.

Vulcan Materials Company: *See*—
Beard, William Q., Jr.; Moyer, Patricia H.; and Penner, Siegfried E., 3,926,847.

W. R. Grace & Co.: *See*—
Der Marderosian, Dikrun; and Tremblay, Paul Albert, 3,926,714.
Guenst, William C., Jr.; and Litschi, Gerold, 3,926,297.
Marans, Nelson S.; and Gluecksman, Alfred, 3,926,755.
Sergeys, Francis J., 3,926,851.

W. Schlafhorst & Co.: *See*—
Frehn, Gunter, 3,926,014.

WABCO Westinghouse GmbH: *See*—
Klatt, Alfred, 3,926,477.

Wada, Shigetaka; and Yamamoto, Noboru, to NGK Insulators, Ltd. Electric fluid heater and resistance heating element therefor. 3,927,300, Cl. 219-381.000.

Wagenhals, Bruce E., to Monogram Industries, Inc. Waste products incineration system for a vehicle or the like. 3,925,827, Cl. 4-114.000.

Wagenhals, Fred William, to Deere & Company. Power lawn mower and mulcher-bagger combination. 3,925,968, Cl. 56-13.300.

Wager, Oleg: *See—*
Broms, Bengt; and Wager, Oleg, 3,925,994.

Wagner Electric Corporation: *See—*
Carlson, Paul A.; and Cake, Arthur F., 3,927,336.

Wagner, Gerhard, to Klockner-Humboldt-Deutz Aktiengesellschaft. Vehicle for transporting bridge sections. 3,925,840, Cl. 14-1.000.

Wagner, Kuno: *See—*
Golitz, Hans Dietrich, deceased; Wagner, Kuno; Quiring, Bernd; and Noll, Walter, 3,927,042.

Wahl, Albert J.: *See—*
Weingrad, Saul; Wahl, Albert J.; Mucha, Richard C.; and Gould, Robert E., 3,926,710.

Wakabayashi, Hiroshi, to Nippon Kogaku K.K. Connecting device. 3,926,493, Cl. 339-12.00R.

Walker, Darrell W., to Phillips Petroleum Company. Processes for dehydrogenation of hydrocarbons. 3,927,138, Cl. 260-680.00E.

Walker, James Donald, to Peabody Galion Corporation. Distribution inlet system with automatic tangential-gate adjustment. 3,926,805, Cl. 210-101.000.

Walker, William S., to Pacific-Atlantic Products, Ltd. Releasable line-holding device. 3,925,920, Cl. 43-43.120.

Wall, Clarence J., to Dorr-Oliver Incorporated. Evaporative concentration of waste sludges with incinerator exhaust gases. 3,926,129, Cl. 110-7.00B.

Wallace Business Forms, Inc.: *See—*
Steidinger, Donald J., 3,926,113.

Wallestad, Victor C., to Fluoroware, Inc. Wafer basket. 3,926,305, Cl. 206-73.000.

Wang, Teh Po, to Wilbur B. Driver Company. Type R and S thermocouple systems having copper-nickel-manganese wire as platinum compensating lead wire. 3,926,681, Cl. 136-241.000.

Ward, Hubert. Shrimp deheader. 3,925,848, Cl. 17-71.000.

Ward, James Patrick, to Lever Brothers Company. Reducing the moisture content of a foodstuff by immersing a frozen foodstuff in thanol maintained at a temperature in the range of −20° to 0°C. 3,925,903, Cl. 34-9.000.

Ward, Joe Arthur, to Dow Chemical Company, The. Dehydrohalogenation of halogenated hydrocarbons. 3,927,131, Cl. 260-654.00D.

Ward, John W., to Union Oil Company of California. Hydrocarbon conversion process utilizing stabilized zeolite catalysts. 3,926,780, Cl. 208-111.000.

Ward, Thomas A.: *See—*
Merker, George; Krupp, Joseph; Ricards, Charles R.; and Ward, Thomas A., 3,926,423.

Ward, Trevor: *See—*
Hemingway, Maurice; and Ward, Trevor, 3,926,543.

Ward, Truman L.; Benerito, Ruth R.; and Hebert, Jacques J., to United States of America, Agriculture. Glassy materials from plumbites and cellulosics. 3,926,709, Cl. 156-309.000.

Warman, Charles Harold: *See—*
Dixon, Percy; and Madigan, David C., 3,927,170.

Warneke, Sehon Lester: *See—*
Quock, Billy; Kelley, Don Howard; Warneke, Sehon Lester; and Gurgiolo, Arthur E., 3,926,867.

Warner-Lambert Company: *See—*
Brown, Richard E.; and Shavel, John, Jr., 3,927,023.
Keegan, James J.; Patel, Girish; and Rubin, Howard, 3,926,870.
Wittekind, Raymond R.; and Shavel, John, Jr., 3,927,022.

Warning, Walter B., Sr., to Automation Development & Engineering Corporation. Cooking apparatus. 3,926,105, Cl. 99-423.000.

Watabe, Ken, to Mitsubishi Jukogyo Kabushiki Kaisha. Stretch adjusting device for a conveyor in a conveyor-line working system. 3,926,304, Cl. 198-208.000.

Watanabe, Toshiyuki: *See—*
Asada, Chiaki; and Watanabe, Toshiyuki, 3,926,621.

Watanabe, Yoshihisa; Imanari, Makoto; Nojiri, Naohiro; and Fuga, Nobuhiko, to Mitsubishi Petrochemical Company Limited. Process for production of acrylic acid. 3,926,915, Cl. 260-530.00N.

Water Science Inc.: *See—*
Hedgpeth, Joel, 3,926,802.

Watkins, Leslie Ray: *See—*
Circle, Sidney Joseph; Fergle, Richard Raymond; Watkins, Leslie Ray; and Hooton, Daniel Edwards, 3,926,940.

Watson, Charles Andrew: *See—*
Venables, Susan Mary; and Watson, Charles Andrew, 3,925,957.

Watson, Frederick D.; and Winslow, Joseph D., Jr., to Petrolite Corporation. Electric treater system. 3,926,774, Cl. 204-308.000.

Watson, Harold: *See—*
Griffin, Anselm C., Jr.; and Watson, Harold, 3,925,849.

Watson, James M., to Cosden Oil & Chemical Company. Thermolysis of styrene oxide. 3,927,110, Cl. 260-599.000.

Watson, Richard N.: *See—*
Ruetman, Sven H.; and Watson, Richard N., 3,927,003.

Watson, Thorpe Wesley: *See—*
Geiger, Kenneth Daniel; Horvath, Steven Joseph; Kallay, Victor Paul; Seymour, Theodore Joseph; Watson, Thorpe Wesley; and Zervoudis, John, 3,926,247.

Waugh, Roger C.: *See—*
Burns, Kenneth S.; Ferment, George R.; and Waugh, Roger C., 3,926,228.

Wavin B.V.: *See—*
de Putter, Warner Jan, 3,926,813.

Wean United, Inc.: *See—*
Krumme, Werner, 3,926,027.

Weaver, Robert F.: *See—*
Blanchard, James S.; and Weaver, Robert F., 3,926,067.

Webb, William M. Movable deck for a top-opening freezer. 3,926,001, Cl. 62-378.000.

Webber, Robert C. Building cooling and pool heating system. 3,926,008, Cl. 62-200.000.

Webcrafters, Inc.: *See—*
Wildeman, Fredric C., 3,926,116.

Weber, Alman A. Crawler track equipped vehicle pallet with wheel support drive rollers. 3,926,272, Cl. 180-1.00C.

Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Hitzel, Volker, to Hoechst Aktiengesellschaft. Sulfonyl ureas and process for preparing them. 3,927,088, Cl. 260-553.0DA.

Weber, Walter W.: *See—*
Costanza, Carl C.; Weber, Walter W.; Betlejewski, Frank W.; and Frystak, Richard, 3,926,514.

Wefers, Norbert; Militz, Uwe; Unglaube, Uwe; and Schwarzkopf, Joachim, to Nixdorf Computer AG. Information evaluation means. 3,927,303, Cl. 235-61.11E.

Wehner, William C., to Multifastener Corporation. Nut, clip and panel assembly. 3,926,235, Cl. 151-21.00C.

Wei, Peter, to Globe Manufacturing Co. Dibenzyl hydroxyl amine stabilizer for spandex. 3,926,909, Cl. 260-45.85N.

Weigert, Wolfgang: *See—*
Lussling, Theodor; Schaefer, Hans; and Weigert, Wolfgang, 3,926,856.
Lussling, Theodor; Schaefer, Hans; and Weigert, Wolfgang, 3,927,007.
Noll, Ewald; Schaefer, Hans; Schmid, Horst; and Weigert, Wolfgang, 3,926,744.

Weigl, John W., to Xerox Corporation. Electrophotographic method and plate employing a phthaldcyanine polymer. 3,926,629, Cl. 96-1.500.

Weigle, Dieter, to Wepuko-Hydraulik GmbH, Firma. Piston pump. 3,926,095, Cl. 92-157.000.

Weil, John V.: *See—*
Sodal, Ingvar E.; Hoivik, Lars; Micco, Alexander J.; Weil, John V.; and Baer, Norman W., 3,926,209.

Weingrad, Saul; Wahl, Albert J.; Mucha, Richard C.; and Gould, Robert E., to Commercial Decal, Inc. Apparatus for applying decalcomania. 3,926,710, Cl. 156-362.000.

Weinstein, Harold, to Sensor Technology, Inc. Process of fabricating photosensitive Darlington device. 3,925,879, Cl. 29-572.000.

Weis, Siegfried K.: *See—*
Frost, Charles C.; and Weis, Siegfried K., 3,926,485.

Weiss, Gunther. Flow cell. 3,926,526, Cl. 356-246.000.

Weisskopf, Heinz: *See—*
Rudin, Ernst; and Weisskopf, Heinz, 3,926,599.

Weitzel, Bruce A.: *See—*
Fish, Leonard A.; Brodsky, Harvey A.; and Weitzel, Bruce A., 3,927,264.

Weller, Horst, to Cillichemie Ernst Vogelmann. Valve. 3,926,218, Cl. 137-625.270.

Wells, Don Charles: *See—*
Bloxham, Glen Lee; and Wells, Don Charles, 3,927,272.

Welt, Dennis. Apex seal. 3,926,538, Cl. 418-115.000.

Welter, Leonard M., to American Optical Corporation. Electron microscope beam tube. 3,927,321, Cl. 250-311.000.

Weman, Per Olof. Locking mechanism for automobile safety belt retractor. 3,926,384, Cl. 242-107.400.

Wendler, Ingrid; and Malaszkiewicz, Jurgen, to Henkel & Cie GmbH. Emulsifiers of water-in-oil creams. 3,926,840, Cl. 252-356.000.

Wendler, Norman L.: *See—*
Girotra, Narindar N.; and Wendler, Norman L., 3,926,965.

Wenninger, Josef, to Volkswagenwerk Aktiengesellschaft. Breakaway universal joint assembly. 3,926,069, Cl. 74-492.000.

Wentworth, Philip Rossell; and Bertioli, Michael Murray, to Lucas Electrical Company Ltd., The. Fuel control systems. 3,927,304, Cl. 235-150.210.

Wepuko-Hydraulik GmbH, Firma: *See—*
Weigle, Dieter, 3,926,095.

Werner, Lincoln Harvey, to Ciba-Geigy Corporation. 3,4-Bisamino-5-sulfamoylbenzoic acids useful as diuretic agents. 3,927,218, Cl. 424-285.000.

Werry, Arthur W., to Dale-Jones Corporation. Light socket mounting. 3,927,315, Cl. 240-52.100.

Wertheimer, Harry P., to Bendix Corporation, The. Exhaust gas recirculation flow control system. 3,926,161, Cl. 123-119.00A.

Wertheimer, Hedda: *See—*
Davies, George; and Wertheimer, Hedda, 3,926,509.

Wescom, Inc.: *See—*
Gupta, Shanti S.; and Pershing, Robert G., 3,927,280.

Westberg, Sven-Olof Johan: *See—*
Lindenfors, Sven Georg; and Westberg, Sven-Olof Johan, 3,926,951.

Western Acadia, Incorporated: *See—*
Todd, Donald A., 3,926,705.

Westhoff, Richard P.: *See—*
Otey, Felix H.; Westhoff, Richard P.; and Mehltretter, Charles L., 3,926,868.

Westinghouse Electric Corporation: *See—*
Billeter, Thomas R.; and Philipp, Lee D., 3,927,369.
Graff, Eugene A., 3,926,837.

Westland Aircraft Ltd.: *See—*
Ciastula, Tadeusz Leopold; Rogers, Victor Alfred Baden; and Balmford, David Ernest Hall, 3,926,536.

Westmont Industries: *See*—
Woodling, Gerald L.; Hewitt, John H.; and Johnson, Ernest D., 3,926,296.

Westvaco Corporation: *See*—
Woodward, Fred E., 3,926,893.

Wetzler, Josef; Neumann, Wilhelm; and Hesselman, Karlheinz, to Fa. Planatolwerk Willy Hesselmann. Apparatus for binding piles of sheets or leaves. 3,926,712, Cl. 156-477.00B.

Weyer, Rudi: *See*—
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Hitzel, Volker, 3,927,088.

Wheat, Lawrence C.: *See*—
Miller, Alfred H.; and Wheat, Lawrence C., 3,926,298.

Whelan, James M.; and Brook, Richard J., to University of Southern California. Oxidation catalyst. 3,926,854, Cl. 252-462.000.

White, Alan Chapman; and Black, Robin Michael, to John Wyeth & Brother, Ltd. Heterocyclic compounds. 3,926,994, Cl. 260-251.00R.

White, Brian Graham: *See*—
Tomlin, Clive Dudley Spencer; Barlow, Charles Brian; and White, Brian Graham, 3,926,611.

White, Hugh Edward; and Lippman, Michael David, to RCA Corporation. Method and apparatus for the detection and control of errors in two-dimensionally compressed image data. 3,927,251, Cl. 178-6.000.

White, James F.: *See*—
Farona, Michael F.; and White, James F., 3,926,950.

White, James T.: *See*—
Brooks, Leon E.; and White, James T., 3,926,006.

White, Walter S. Heat exchanger window. 3,925,945, Cl. 52-171.000.

Whited, Charles A., to Xerox Corporation. Development apparatus for an electrostatographic printing machine. 3,926,516, Cl. 355-3.0DD.

Whitehead, William F.; and Rogers, Ralph L., to Atlantic Richfield Company. Osmium recovery from glycol solutions. 3,927,168, Cl. 423-22.000.

Whitehouse, David John: *See*—
Jungles, John; Whitehouse, David John; and Nightingale, Eric Gordon, 3,927,253.

Whittington, Robert John: *See*—
More, Arthur Rowlatt; and Whittington, Robert John, 3,926,042.

Wichman, Sven Hjalmar: *See*—
Closner, John J.; Marchaj, Tadeusz Josef; and Wichman, Sven Hjalmar, 3,926,134.

Wick, Arnold, to Ciba-Geigy Corporation. Bis-(polyhalogenoanilino)-anthraquinones. 3,927,043, Cl. 260-381.000.

Widmer, Erich: *See*—
Furst, Andor; Buchschacher, Paul; Kagi, Dieter; Meier, Werner; Muller, Marcel; and Widmer, Erich, 3,927,032.

Wiegers, Wilhelmus J.; and Hall, John B., to International Flavors & Fragrances Inc. Processes for the preparation of cyclic aldehydes. 3,927,109, Cl. 260-598.000.

Wieligmann, Friedrich: *See*—
Birkenfeld, Richard; and Wieligmann, Friedrich, 3,925,964.

Wiggerman, Ronald E., to Attwood Corporation. Bow light for water craft. 3,927,314, Cl. 240-7.500.

Wiggill, John Bentley, to Du Pont de Nemours, E. I., and Company. Rock bolt/anchoring resin cartridge system. 3,925,996, Cl. 61-45.00B.

Wilbur B. Driver Company: *See*—
Wang, Teh Po, 3,926,681.

Wildeman, Fredric C., to Webcrafters, Inc., a part interest. Dampening apparatus for offset printing press. 3,926,116, Cl. 101-148.000.

Wildmoser, Alfred; and Dannhorn, Erich, to Linde Aktiengesellschaft. Regeneration of scrubbing agent used for the removal of CO_2 and H_2S from gases containing polymerizable hydrocarbons. 3,926,591, Cl. 55-68.000.

Wilje, Sven Oscar Eric. Foot roller means. 3,926,449, Cl. 280-11.230.

Wilks, Alan D.; and Youtsey, Karl J., to Universal Oil Products Company. Electrically conductive compositions of matter. 3,926,570, Cl. 29-195.000.

Williams, David; and Lucey, George K., Jr., to United States of America, Army. Rain impact sensing proximity fuze. 3,926,120, Cl. 102-70.20P.

Williams, Frederick W.; and Sheinson, Ronald S., to United States of America, Navy. Vertical tube combustion reactor. 3,926,562, Cl. 23-253.0PC.

Williams, Herschel Claude: *See*—
Wristers, Harry Jan; and Williams, Herschel Claude, 3,926,848.

Williams, Leonard E., Jr.; and Aiken, William B., to Cameron Iron Works, Inc. Well completion apparatus. 3,926,457, Cl. 285-39.000.

Williams, Malcolm, to Lucas Electrical Company Limited, The. Fuel control systems. 3,926,154, Cl. 123-32.0EA.

Williams, Robert C.: *See*—
Abney, Dave L.; Williams, Robert C.; and Gilbert, Horace E., 3,926,409.

Williams, Sherrod A., to Mobil Oil Corporation. Waterflooding employing surfactants derived from metallic soaps. 3,926,255, Cl. 166-270.000.

Willis, Gordon G.; Ivy, John B.; Boozalis, Theodore S.; and Cragar, Darryl E., to Dow Chemical Company, The. Process for producing 1,1,1-trichloroethane. 3,927,132, Cl. 260-658.00R.

Willis, Harry G.: *See*—
Seib, James N.; and Willis, Harry G., 3,926,594.

Willis, Wilfred Ernest: *See*—
Gabriel, Lester H.; and Willis, Wilfred Ernest, 3,927,163.

Wilson, Bobby R. Apparatus for supporting and positioning of a workpiece during welding. 3,926,422, Cl. 269-60.000.

Wilson, John D.; Nyiri, Laszlo K.; Humphrey, Arthur E.; and Harmes, Clyde S., III, to New Brunswick Scientific Co., Inc. Method and apparatus for control of biochemical processes. 3,926,737, Cl. 195-108.000.

Wilson, John D.: *See*—
Nyiri, Laszlo P.; Humphrey, Arthur E.; and Harmes, Clyde S., III, 3,926,738.

Wilson, Raymond F.; Peck, Reese A.; Estes, John H.; and Brandenburg, John T., to Texaco Inc. Upgrading of paraffinic gasoline blending components by cyclization with a platinum/magnesium oxide alumina matrix catalyst. 3,926,779, Cl. 208-65.000.

Wimmer, Gunther W.: *See*—
Lee, Barry T.; Wimmer, Gunther W.; and Hyatt, Gilbert P., 3,927,411.

Winchell, Harry S.; and Lewis, Robert E., to General Electric Company. Radioactive gas-containing polymeric capsule. 3,926,176, Cl. 128-1.200.

Winkler, Alfred, to Agfa-Gevaert AG. Circular magazine for photographic transparencies. 3,926,313, Cl. 206-455.000.

Winslow, Joseph D., Jr.: *See*—
Watson, Frederick D.; and Winslow, Joseph D., Jr., 3,926,774.

Winter, Gerhard: *See*—
Holle, Bernd; and Winter, Gerhard, 3,926,660.

Winters, Earl Dallas: *See*—
Newby, Kenneth Russ; and Winters, Earl Dallas, 3,926,747.

Wisconsin Alumni Research Foundation: *See*—
Petzke, Jeffrey C.; and Bahr, Dennis E., 3,926,179.

Wise, James Charles. Mineral separation apparatus. 3,926,793, Cl. 209-426.000.

Witkowski, Joseph T.; and Robins, Roland K., to ICN Pharmaceuticals, Inc. 1,2,4-Triazol E-3-carboxamides for inhibiting virus infections. 3,927,216, Cl. 424-269.000.

Wittekind, Raymond R.; and Shavel, John, Jr., to Warner-Lambert Company. 2-Amino-1-(2-imidazolin-2-yl)-2-imidazolines. 3,927,022, Cl. 260-309.600.

Wittkopp, Fritz: *See*—
Kunne, Kurt; and Wittkopp, Fritz, 3,927,326.

Wittry, David B., to University of Southern California. Crystal for X-ray crystal spectrometer. 3,927,319, Cl. 250-273.000.

Wojciechowski, Henryk: *See*—
Zielonko, Romuald; Hoja, Jerzy; and Wojciechowski, Henryk, 3,927,368.

Wojtowicz, John A., to Olin Corporation. Preparation of halobutyrate esters. 3,927,074, Cl. 260-487.000.

Wolfe, Merritt W., to Goodyear Tire & Rubber Company, The. Portable rotating kettle used in retreading tires. 3,926,711, Cl. 156-394.000.

Wolk, Ronald H., to Hydrocarbon Research, Inc. Ebullated bed process. 3,926,783, Cl. 208-157.000.

Wollner, Johannes: *See*—
Meyer-Stoll, Hans-Albrecht; Wollner, Johannes; and Schittek, Hans-Heinz, 3,927,198.

Wolterman, William G., to United States of America, Army. Grenade with fuze (U). 3,926,122, Cl. 102-79.000.

Wood, Robert W.: *See*—
Rosenquest, Allen H.; Knipper, Aloysius J.; and Wood, Robert W., 3,927,222.

Wood, Rolland E. Bag closure device. 3,925,852, Cl. 24-30.50R.

Woodall, Roger E.: *See*—
Searle, Robert J. G.; and Woodall, Roger E., 3,927,068.

Woodling, Gerald L.; Hewitt, John H.; and Johnson, Ernest D., to Westmont Industries. Passenger conveyor system. 3,926,296, Cl. 198-16.00R.

Woods, M. Bruce: *See*—
Camp, Lionel S., 3,926,167.

Woods, Robert L., to United States of America, Army. Laminar fluidic multiplier. 3,926,221, Cl. 137-819.000.

Woodward, Fred E., to Westvaco Corporation. Polish containing a C_{21} -cycloaliphatic dicarboxylic acid. 3,926,893, Cl. 260-29.60R.

Worden, Donald P., to Tenneco Inc. Weld bead form rolls. 3,927,292, Cl. 219-67.000.

Wouters, Ludovicus Josephus Albertus: *See*—
Wuyts, Oscar; Carpentier, Felix Joanna Petrus; and Wouters, Ludovicus Josephus Albertus, 3,927,277.

Wren, John Pelham, to Plessey Handel und Investments A.G. Record players. 3,926,440, Cl. 274-14.000.

Wright, Charles D.: *See*—
Koshar, Robert J.; Husted, Donald R.; Wright, Charles D.; and Zollinger, Joseph La Mar, 3,927,103.

Wristers, Harry Jan; and Williams, Herschel Claude, to Exxon Research & Engineering Co. Process for increasing activity of heavy transition metal halide stereospecific catalysts. 3,926,848, Cl. 252-442.000.

Wuhrer, Josef, to Rheinische Kalksteinwerke GmbH. Process for the production of synthetic wollastonite and diopside. 3,926,647, Cl. 106-39.500.

Wunning, Joachim; Bieber, Rolf; and Lustig, Heinz, to J. Aichelin, Firma. Method and apparatus for testing of a liquid to determine a minor admixture of a lower boiling point material. 3,926,038, Cl. 73-61.10R.

Wuyts, Oscar; Carpentier, Felix Joanna Petrus; and Wouters, Ludovicus Josephus Albertus, to International Standard Electric Corporation. Distributing frame. 3,927,277, Cl. 179-98.000.

Wyser, Paul: *See*—
Uebelhart, Heinrich; Schmid, Erich; and Wyser, Paul, 3,926,048.

Xerox Corporation: *See*—
Bean, Lloyd, 3,926,626.
Berry, Peter J.; and Maguire, Gerald J., 3,926,518.
Brach, Paul J.; and Six, Hugh A., 3,927,026.
Goldstein, Irving S., 3,926,762.
Honjo, Satoru; Tamai, Yasuo; and Tsuji, obuo, 3,926,825.
Kercher, Dean S.; and Rod, Trygve R., 3,926,352.
Lipani, Anthony F., 3,926,824.
Rebres, Robert P., 3,926,519.
Reyner, Noel L., 3,926,338.
Thettu, Raghulinga R., 3,926,058.
Weigl, John W., 3,926,629.
Whited, Charles A., 3,926,516.

Xonics, Inc.: *See*—
Azzarelli, Teodoro; Muntz, Eric P.; and Scott, Paul B., 3,927,322.

Yale, Harry Louis, to E. R. Squibb & Sons, Inc. 2-(O-aminophenylthio)benzyl alcohols. 3,927,093, Cl. 260-571.000.

Yamada, Minoru: *See*—
Arai, Atsuaki; Oishi, Yasushi; Yamada, Minoru; Furutachi, Nobuo; and Nakamura, Kotaro, 3,926,631.

Yamada, Shozo: *See*—
Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; Ishikawa, Hisao; Yamada, Shozo; Yasuda, Yasushi; and Asada, Mitsuo, 3,927,034.

Yamagishi, Seiichi: *See*—
Toriumi, Shiro; and Yamagishi, Seiichi, 3,926,426.

Yamaguchi, Kazuo: *See*—
Enokido, Nobuo; Murakami, Atsushi; Yamaguchi, Kazuo; Kanoh, Natsuki; Tanaka, Toru; Okano, Shigeaki; and Suzuki, Masatoshi, 3,926,929.

Yamamoto, Hisao: *See*—
Ishizumi, Kikuo; Mori, Kazuo; Yamamoto, Michihiro; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 3,926,993.

Yamamoto, Katsuo: *See*—
Ohfuka, Toshio; Schichijo, Yoshihisa; Ichikawa, Yasushi; and Yamamoto, Katsuo, 3,926,930.

Yamamoto, Kohei: *See*—
Tsuchida, Takashi; Shinoda, Kenichi; Yamamoto, Kohei; Murata, Tomoya; and Maeda, Yoshihiro, 3,926,678.

Yamamoto, Michihiro: *See*—
Ishizumi, Kikuo; Mori, Kazuo; Yamamoto, Michihiro; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 3,926,993.

Yamamoto, Noboru: *See*—
Wada, Shigetaka; and Yamamoto, Noboru, 3,927,300.

Yamamoto, Takuo: *See*—
Nakamura, Kenji; Fukuyama, Kunihiko; and Yamamoto, Takuo, 3,927,279.

Yamashita, Tadaoki: *See*—
Kawabata, Hidetsugu; and Yamashita, Tadaoki, 3,927,328.
Nada, Naohiro; and Yamashita, Tadaoki, 3,926,836.

Yamazaki, Hideo: *See*—
Nitanai, Kiyoaki; Okubo, Atsuo; and Yamazaki, Hideo, 3,926,959.

Yanagihara, Hideki: *See*—
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,927,114.

Yanagihara, Tadahisa; and Fukahori, Kentaro, to Toyo Soda Manufacturing Co., Ltd. Process for preparation of diisopropylbenzene. 3,927,134, Cl. 260-671.00P.

Yanagimachi, Akio: *See*—
Yoshino, Takehiko; Yanagimachi, Akio; Uehara, Takashi; Takezawa, Teruhiro; Fukuda, Masaaki; and Kayano, Tatsuo, 3,927,269.

Yanik, Stephen J.: *See*—
Christman, Robert D.; and Yanik, Stephen J., 3,926,784.

Yashiki, Takatsuka: *See*—
Ohno, Yoshitomo; Takigawa, Yasuko; Aoki, Katsuo; and Yashiki, Takatsuka, 3,927,205.

Yasuda, Yasushi: *See*—
Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; Ishikawa, Hisao; Yamada, Shozo; Yasuda, Yasushi; and Asada, Mitsuo, 3,927,034.

Yates, Michael Richard: *See*—
Edgar, Owen Burchell; and Yates, Michael Richard, 3,926,924.

Yazaki Sogyo Kabushiki Kaisha: *See*—
Okamoto, Keiji, 3,926,142.

Yeda Research and Development Co., Ltd.: *See*—
Margulies, Leon; Mazur, Yehuda; Sagiv, Jacob; and Yogev, Amnon, 3,926,524.

Yelland, Michael, to Imperial Chemical Industries Limited. Metallized formazan compounds containing a reactive group. 3,926,942, Cl. 260-146.00T.

Yen, Shiao-Ping Siao: *See*—
Rembaum, Alan; and Yen, Shiao-Ping Siao, 3,927,242.

Yeoman, Elfed: *See*—
Fogg, Sidney George; King, Peter Graham; and Yeoman, Elfed, 3,926,877.

Yogev, Amnon: *See*—
Margulies, Leon; Mazur, Yehuda; Sagiv, Jacob; and Yogev, Amnon, 3,926,524.

Yokobe, Tetsuo: *See*—
Nakanishi, Michio; Yokobe, Tetsuo; Arai, Tomio; and Abe, Masao, 3,927,011.

Yokogawa, Kanae: *See*—
Yoshimura, Yoshio; Yokogawa, Kanae; and Kawata, Shigeo, 3,927,200.

Yokohama Rubber Company, Ltd., The: *See*—
Fujiwara, Susumu; Okada, Takao; Koyama, Masao; Akashi, Hiromitsu; and Nishikawa, Yoichi, 3,927,309.

Yokokura, Hisao: *See*—
Miyadera, Yasuo; and Yokokura, Hisao, 3,926,914.

Yokomizo, Yuhji: *See*—
Ichinose, Noboru; Yokomizo, Yuhji; and Katsura, Masaki, 3,926,858.

Yokota, Minoru: *See*—
Hayashi, Makoto; Hinata, Masanori; Yokota, Minoru; and Kondo, Takasi, 3,926,023.

Yokota, Yukio: *See*—
Sugizaki, Atsushi; Hirose, Takeshi; Yokota, Yukio; Okumura, Akio; Oishi, Yasushi; and Arai, Atsuaki, 3,926,634.

Yokotsuka, Tamotsu: *See*—
Ishiyama, Jiro; and Yokotsuka, Tamotsu, 3,926,725.

Yoneda, Masahiko: *See*—
Kanzaki, Toshihiko; Fujisawa, Yukio; Shirafuji, Hideo; Nara, Kiyoshi; and Yoneda, Masahiko, 3,926,729.

York, Lyle E.: *See*—
Blomstrom, Gary D.; Randour, Victor; and York, Lyle E., 3,926,273.

Yorkanis, Bernard Joseph, to RCA Corporation. Black level clamping circuit for a television signal processor. 3,927,255, Cl. 178-7.3DC.

Yoshida Kogyo K.K.: *See*—
Yoshikawa, Kiichi, 3,925,859.

Yoshida Kogyo Kabushiki Kaisha: *See*—
Kihara, Toshiyuki, 3,925,857.
Matsuda, Yoshio, 3,926,017.

Yoshikawa, Kiichi, to Yoshida Kogyo K.K. Continuous coupling element for slide fasteners. 3,925,859, Cl. 24-205.16C.

Yoshikawa, Shinsuke; Endo, Hiroyuki; and Terasaki, Shuji, to Kureha Kagaku Kogyo Kabushiki Kaisha. Production of ink-feeding and writing core for writing instrument. 3,927,156, Cl. 264-15.000.

Yoshikawa, Yoshio; Sugio, Akitoshi; Kato, Tomotake; and Okazaki, Heizo, to Mitsubishi Gas Chemical Company, Inc. Method for producing anhydrous hydrosulfite. 3,927,190, Cl. 423-515.000.

Yoshimura, Takafumi: *See*—
Gondo, Hisashi; Eguchi, Naoki; Yoshimura, Takafumi; and Araki, Masaki, 3,926,687.

Yoshimura, Yoshio; Yokogawa, Kanae; and Kawata, Shigeo, to Dainippon Pharmaceutical Co., Ltd. Stabilization of microorganism cells lytic enzyme. 3,927,200, Cl. 424-50.000.

Yoshino, Takehiko; Yanagimachi, Akio; Uehara, Takashi; Takezawa, Teruhiro; Fukuda, Masaaki; and Kayano, Tatsuo, to Nippon Hoso Kyokai Hitachi Ltd.; and Hitachi Electronics Ltd Time division multiplexing transmission system. 3,927,269, Cl. 179-15.0BS.

Yoshioka, Kengo; and Shiraishi, Teruhiko, to Nippon Steel Corporation. Variable speed turning chute for raw material to be discharged. 3,926,289, Cl. 193-23.000.

Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Nakanishi, Michio; Yokobe, Tetsuo; Arai, Tomio; and Abe, Masao, 3,927,011.

Young, John R.: *See*—
Harrell, Edsel A.; Hare, Woodrow W.; and Young, John R., 3,926,371.

Youngblood, Hugh A., Jr. Quick closing clamp. 3,925,862, Cl. 24-252.00R.

Youtsey, Karl J.: *See*—
Wilks, Alan D.; and Youtsey, Karl J., 3,926,570.

Yumde, Yasufumi: *See*—
Hayashi, Kenji; Yumde, Yasufumi; and Kawamura, Kotaro, 3,927,420.

Yumoto, Norio: *See*—
Katori, Tatsuhiko; Sato, Giichi; Kihara, Takashi; Yumoto, Norio; Makino, Shigeru; and Harada, Juntaro, 3,927,082.

Zak, Thomas S.: *See*—
Grane, Henry R.; and Zak, Thomas S., 3,927,120.
Grane, Henry R.; and Zak, Thomas S., 3,927,121.

Zakharova, Nina Vasilievna: *See*—
Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovidh; Zakharova, Nina Vasilievna; Golubenko, Mikhail Afanasievich; Tolstikov, Genrikh Alexandrovich; Kholodovskaya, Rakhil Samoilovna; Shalimova, Zoya Stepanovna; Legostaeva, Taisia Vasilievna; Popov, Vasily Dmitrievich; and Dolidze, Vladimir Romanovich, 3,927,038.

Zakrzewski, James Richard: *See*—
Guilbault, Lawrence James; and Zakrzewski, James Richard, 3,926,718.

Zaleski, John F., to Singer Company, The. Transformer coupled transistor amplifier. 3,927,380, Cl. 330-21.000.

Zambelli, Claude Jean Virgile. Vibro-massaging apparatus. 3,926,180, Cl. 128-32.000.

Zambolin, Adriano; and De Falco, Gianfranco, to Ing. C. Olivetti & Co., S.p.A. Control for printing and service functions of an accounting machine. 3,927,274, Cl. 197-19.000.

Zappel, Werner. Railway car shunting locomotive. 3,926,128, Cl. 105-26.00R.

Zavasnik, Fred J., to Continental Can Company, Inc. Plastic container for pressurized liquid. 3,926,324, Cl. 215-1.00C.

Zawadski, Andrzej, to Ram Meter, Inc. Control circuits for auxiliary light source for use with high intensity discharge lamps. 3,927,348, Cl. 315-88.000.

Zeh, Albert: *See*—
Lange, Jost; Schneider, Gerhart; and Zeh, Albert, 3,926,650.

Zeiffer, Dieter F., to Gaston County Dyeing Machine Company. Piece goods extraction apparatus and method. 3,925,905, Cl. 34-16.000.

Zeininger, Siegfried: *See*—
Beck, Gerhard; and Zeininger, Siegfried, 3,927,407.

Zelenko, John: *See*—
Nadasi, Laszlo; Nadasi, Marton; Zelenko, John; and Pero, Donald E., 3,926,471.

Zeller, Gary P.: *See*—
Burns, Ronald N.; Landwehr, Dewayne A.; Schroeder, Roger H.; Vogelei, Robert A.; and Zeller, Gary P., 3,926,462.
Landwehr, DeWayne A.; and Zeller, Gary P., 3,926,463.

Zeller, Josef: *See*—
Meier, Walter; Zeller, Josef; Koenig, Peter J.; Bruderer, Werner; and Schmid, Markus, 3,926,244.

Zellmer, Neale A.: *See*—
Stewart, James A.; and Zellmer, Neale A., 3,927,266.

Zengel, Hans-Georg; Toth, Anton; Magerlein, Helmut; and Meyer, Gerhard, to Akzo N. V. Process for the production of a mercaptocarboxylic acid. 3,927,085, Cl. 260-526.00S.

Zenith Cutter Company: *See*—
Blazer, Cedric W., 3,926,084.

Zenith Radio Corporation: *See*—
Citta, Richard W., 3,927,316.
Polley, Eugene J., 3,927,252.

Zervoudis, John: *See*—
Geiger, Kenneth Daniel; Horvath, Steven Joseph; Kallay, Victor Paul; Seymour, Theodore Joseph; Watson, Thorpe Wesley; and Zervoudis, John, 3,926,247.

Zetlmeisl, Michael J.; May, Walter R.; and Annand, Robert R., to Petrolite Corporation. Corrosion inhibitor for vanadium-containing fuels. 3,926,577, Cl. 44-51.000.

Zettl, Heinrich; and Decker, Klaus, to Henrich KG, Firma. Apparatus for the heating or annealing of materials in elongated form. 3,927,296, Cl. 219-155.000.

Zhukov, Oleg Nikolaevich; Medvinsky, Moisei Davidovich; and Ryk, Vladimir Izidorovich. Pulsed ultrasonic flaw detector. 3,926,039, Cl. 73-67.700.

Ziegler, Walter Herbert, to General Electric Company. Anti-icing system for a gas turbine engine. 3,925,979, Cl. 60-39.070.

Zielonko, Romuald; Hoja, Jerzy; and Wojciechowski, Henryk, to Politechnika Gdanska. Method of breaking electric networks for measurement of parameters of network components. 3,927,368, Cl. 324-57.00R.

Zimmermann, Frank: *See*—
Dengel, Ferdinand; Ehrmann, Oskar; Friedrich, Ludwig; and Zimmermann, Frank, 3,926,995.

Zimnyakov, Alexandr Vasilievich: *See*—
Orlov, Petr Nikolaevich; Nesterov, Jury Ivanovich; Kudashov, Vasily Yakovlevich; Zimnyakov, Alexandr Vasilievich; Ermakova, Irina Nikolaevna; Bogomolov, Igor Vasilievich; Nirman, Efim Matveevich; and Sokolov, Vladimir Dmitrievich, 3,925,936.

Zlatareff, Vassil: *See*—
Glaser, Heinz; and Zlatareff, Vassil, 3,926,707.

Zollinger, Joseph La Mar: *See*—
Koshar, Robert J.; Husted, Donald R.; Wright, Charles D.; and Zollinger, Joseph La Mar, 3,927,103.

Zoltner, Thomas J.: *See*—
Low, Jack B.; Crist, Buckley; and Zoltner, Thomas J., 3,926,347.

Zschunke, Willmut, to International Standard Electric Corporation. Arrangement for improving the reproduction of amplitude jumps during transmission using differential pulse code modulation. 3,927,372, Cl. 325-38.00B.

Zygraich, Nathan; and Huygelen, Constant, to Recherche et Industrie Therapeutiques (R.I.T.). Live bovine adenovirus vaccines, preparation thereof and method of vaccination using them. 3,927,208, Cl. 424-89.000.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 24,017	3,914,140	Oct. 21, 1975	B 290,328	3,924,838	Dec. 9, 1975
B 24,018	3,914,206	Oct. 21, 1975	B 291,104	3,925,007	Dec. 9, 1975
B 64,868	3,914,141	Oct. 21, 1975	B 291,694	3,925,339	Dec. 9, 1975
B 78,331	3,914,142	Oct. 21, 1975	B 292,054	3,915,877	Oct. 28, 1975
B 112,422	3,913,484	Oct. 21, 1975	B 292,126	3,914,465	Oct. 21, 1975
B 150,560	3,913,654	Oct. 21, 1975	B 292,140	3,914,340	Oct. 21, 1975
B 176,995	3,915,773	Oct. 28, 1975	B 292,300	3,927,167	Dec. 16, 1975
B 189,772	3,925,367	Dec. 9, 1975	B 292,563	3,923,653	Dec. 2, 1975
B 189,773	3,925,405	Dec. 9, 1975	B 293,378	3,923,725	Dec. 2, 1975
B 190,679	3,925,346	Dec. 9, 1975	B 293,437	3,913,414	Oct. 21, 1975
B 198,810	3,916,043	Oct. 28, 1975	B 294,103	3,924,396	Dec. 9, 1975
B 204,161	3,924,605	Dec. 9, 1975	B 294,579	3,916,737	Nov. 4, 1975
B 207,272	3,914,123	Oct. 21, 1975	B 294,673	3,916,023	Oct. 28, 1975
B 211,786	3,914,300	Oct. 21, 1975	B 295,481	3,921,593	Nov. 25, 1975
B 213,211	3,925,269	Dec. 9, 1975	B 295,674	3,916,107	Oct. 28, 1975
B 220,683	3,914,471	Oct. 21, 1975	B 295,860	3,923,880	Dec. 2, 1975
B 222,188	3,914,739	Oct. 21, 1975	B 299,267	3,917,106	Nov. 4, 1975
B 223,621	3,925,526	Dec. 9, 1975	B 300,353	3,921,734	Nov. 25, 1975
B 224,323	3,925,476	Dec. 9, 1975	B 302,692	3,924,598	Dec. 9, 1975
B 233,383	3,925,424	Dec. 9, 1975	B 302,836	3,923,573	Dec. 2, 1975
B 233,741	3,925,326	Dec. 9, 1975	B 303,655	3,924,642	Dec. 9, 1975
B 235,011	3,925,086	Dec. 9, 1975	B 303,702	3,914,131	Oct. 21, 1975
B 235,925	3,924,949	Dec. 9, 1975	B 304,687	3,924,783	Dec. 9, 1975
B 236,609	3,925,187	Dec. 9, 1975	B 305,417	3,915,882	Oct. 28, 1975
B 237,953	3,924,051	Dec. 2, 1975	B 305,868	3,921,463	Nov. 25, 1975
B 239,289	3,922,711	Nov. 25, 1975	B 305,881	3,923,478	Dec. 2, 1975
B 241,433	3,923,711	Dec. 2, 1975	B 306,829	3,925,411	Dec. 9, 1975
B 245,194	3,919,179	Nov. 11, 1975	B 306,938	3,916,050	Oct. 28, 1975
B 248,916	3,920,862	Nov. 18, 1975	B 307,677	3,915,276	Oct. 28, 1975
B 251,109	3,914,148	Oct. 21, 1975	B 308,661	3,924,349	Dec. 9, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 308,892	3,919,624	Nov. 11, 1975
B 252,947	3,923,803	Dec. 2, 1975	B 309,207	3,914,743	Oct. 21, 1975
B 254,211	3,917,677	Nov. 4, 1975	B 309,499	3,922,002	Nov. 25, 1975
B 254,708	3,923,878	Dec. 2, 1975	B 309,681	3,927,374	Dec. 16, 1975
B 255,756	3,923,781	Dec. 2, 1975	B 309,755	3,919,468	Nov. 11, 1975
B 256,334	3,924,988	Dec. 9, 1975	B 309,756	3,914,136	Oct. 21, 1975
B 256,936	3,925,513	Dec. 9, 1975	B 309,860	3,922,485	Nov. 25, 1975
B 258,687	3,914,221	Oct. 21, 1975	B 310,149	3,924,705	Dec. 9, 1975
B 259,236	3,924,874	Dec. 9, 1975	B 310,271	3,923,689	Dec. 2, 1975
B 260,455	3,925,634	Dec. 9, 1975	B 311,313	3,925,142	Dec. 9, 1975
B 260,945	3,925,250	Dec. 9, 1975	B 311,317	3,918,975	Nov. 11, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 311,413	3,925,515	Dec. 9, 1975
B 261,828	3,925,551	Dec. 9, 1975	B 311,910	3,924,357	Dec. 9, 1975
B 262,241	3,925,528	Dec. 9, 1975	B 311,911	3,925,233	Dec. 9, 1975
B 262,287	3,921,209	Nov. 18, 1975	B 312,139	3,925,530	Dec. 9, 1975
B 262,378	3,914,410	Oct. 21, 1975	B 312,477	3,923,714	Dec. 2, 1975
B 264,833	3,923,566	Dec. 2, 1975	B 313,098	3,925,045	Dec. 9, 1975
B 265,369	3,925,245	Dec. 9, 1975	B 313,531	3,925,548	Dec. 9, 1975
B 265,727	3,914,479	Oct. 21, 1975	B 313,594	3,924,626	Dec. 9, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 313,900	3,915,932	Oct. 28, 1975
B 266,195	3,923,599	Dec. 2, 1975	B 314,049	3,920,588	Nov. 18, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 314,255	3,923,764	Dec. 2, 1975
B 270,089	3,923,875	Dec. 2, 1975	B 314,271	3,921,845	Nov. 25, 1975
B 271,104	3,925,400	Dec. 9, 1975	B 314,489	3,925,016	Dec. 9, 1975
B 274,945	3,924,992	Dec. 9, 1975	B 314,977	3,923,459	Dec. 2, 1975
B 275,426	3,925,168	Dec. 9, 1975	B 315,363	3,920,673	Nov. 18, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 315,397	3,923,963	Dec. 2, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 315,731	3,914,108	Oct. 21, 1975
B 277,449	3,924,048	Dec. 2, 1975	B 316,014	3,920,861	Nov. 18, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 316,239	3,913,546	Oct. 21, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 316,917	3,925,494	Dec. 9, 1975
B 279,583	3,923,749	Dec. 2, 1975	B 317,080	3,925,324	Dec. 9, 1975
B 280,015	3,925,378	Dec. 9, 1975	B 317,347	3,923,552	Dec. 2, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 317,624	3,925,167	Dec. 9, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 318,195	3,915,699	Oct. 28, 1975
B 281,943	3,924,013	Dec. 2, 1975	B 318,618	3,915,365	Oct. 28, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 318,640	3,925,186	Dec. 9, 1975
B 282,252	3,924,997	Dec. 9, 1975	B 318,745	3,916,571	Nov. 4, 1975
B 283,124	3,923,512	Dec. 2, 1975	B 319,226	3,925,082	Dec. 9, 1975
B 283,300	3,925,011	Dec. 9, 1975	B 319,339	3,916,056	Oct. 28, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 319,402	3,919,568	Nov. 11, 1975
B 285,200	3,923,680	Dec. 2, 1975	B 320,261	3,924,033	Dec. 2, 1975
B 285,796	3,914,303	Oct. 21, 1975	B 320,452	3,925,083	Dec. 9, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 320,603	3,915,571	Oct. 28, 1975
B 286,614	3,924,696	Dec. 9, 1975	B 321,018	3,921,623	Nov. 25, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 321,101	3,917,163	Nov. 4, 1975
B 287,270	3,924,825	Dec. 9, 1975	B 321,938	3,923,889	Dec. 2, 1975
B 287,275	3,925,141	Dec. 9, 1975	B 322,182	3,925,390	Dec. 9, 1975
B 287,373	3,918,568	Nov. 11, 1975	B 322,239	3,920,973	Nov. 18, 1975
B 288,018	3,925,239	Dec. 9, 1975	B 322,564	3,914,373	Oct. 21, 1975
B 288,627	3,916,179	Oct. 28, 1975	B 322,611	3,920,863	Nov. 18, 1975
B 288,638	3,925,132	Dec. 9, 1975	B 322,777	3,924,382	Dec. 9, 1975
B 289,175	3,924,309	Dec. 9, 1975	B 323,127	3,923,967	Dec. 2, 1975
B 289,471	3,917,184	Nov. 4, 1975	B 323,191	3,914,566	Oct. 21, 1975
B 289,523	3,921,166	Nov. 18, 1975	B 323,203	3,916,165	Oct. 28, 1975
B 289,883	3,925,063	Dec. 9, 1975	B 323,568	3,920,536	Nov. 18, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 323,666	3,924,568	Dec. 9, 1975	B 350,589	3,927,419	Dec. 16, 1975
B 324,505	3,925,294	Dec. 9, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 324,739	3,924,990	Dec. 9, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 324,879	3,923,538	Dec. 2, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 325,102	3,924,355	Dec. 9, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 325,262	3,921,304	Nov. 25, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 326,514	3,925,080	Dec. 9, 1975	B 351,348	3,923,563	Dec. 2, 1975
B 327,109	3,925,350	Dec. 9, 1975	B 351,421	3,914,733	Oct. 21, 1975
B 327,363	3,923,504	Dec. 2, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 327,612	3,925,620	Dec. 9, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 327,899	3,925,674	Dec. 9, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 328,200	3,916,031	Oct. 28, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 328,205	3,914,106	Oct. 21, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 328,210	3,914,275	Oct. 21, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 328,870	3,916,486	Nov. 4, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 329,115	3,924,727	Dec. 9, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 329,476	3,920,562	Nov. 18, 1975	B 352,950	3,922,590	Nov. 25, 1975
B 329,612	3,925,128	Dec. 9, 1975	B 352,965	3,921,926	Nov. 25, 1975
B 329,787	3,920,688	Nov. 18, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 329,816	3,923,947	Dec. 2, 1975	B 353,387	3,924,404	Dec. 9, 1975
B 330,536	3,925,452	Dec. 9, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 330,828	3,913,589	Oct. 21, 1975	B 354,008	3,925,081	Dec. 9, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 354,098	3,925,547	Dec. 9, 1975
B 331,557	3,916,577	Nov. 4, 1975	B 354,145	3,927,279	Dec. 16, 1975
B 331,895	3,916,403	Oct. 28, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 332,527	3,924,017	Dec. 2, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 332,811	3,924,359	Dec. 9, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 333,876	3,921,208	Nov. 18, 1975	B 355,095	3,925,656	Dec. 9, 1975
B 333,928	3,927,172	Dec. 16, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 334,251	3,924,719	Dec. 9, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 334,868	3,919,469	Nov. 11, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 334,985	3,923,912	Dec. 2, 1975	B 355,876	3,925,685	Dec. 9, 1975
B 335,741	3,925,615	Dec. 9, 1975	B 356,253	3,925,025	Dec. 9, 1975
B 335,773	3,920,953	Nov. 18, 1975	B 356,602	3,927,393	Dec. 16, 1975
B 336,129	3,923,606	Dec. 2, 1975	B 356,724	3,924,586	Dec. 9, 1975
B 336,243	3,925,422	Dec. 9, 1975	B 357,039	3,924,406	Dec. 9, 1975
B 336,345	3,925,179	Dec. 9, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 357,131	3,924,453	Dec. 9, 1975
B 336,902	3,918,897	Nov. 11, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 336,946	3,919,425	Nov. 11, 1975	B 357,682	3,924,973	Dec. 9, 1975
B 336,978	3,923,968	Dec. 2, 1975	B 357,803	3,919,470	Nov. 11, 1975
B 337,235	3,919,386	Nov. 11, 1975	B 358,174	3,924,958	Dec. 9, 1975
B 337,409	3,925,258	Dec. 9, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 358,311	3,923,561	Dec. 2, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 358,939	3,924,713	Dec. 9, 1975
B 337,787	3,923,506	Dec. 2, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 339,057	3,924,822	Dec. 9, 1975	B 359,187	3,924,525	Dec. 9, 1975
B 339,218	3,925,121	Dec. 9, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 340,212	3,922,645	Nov. 25, 1975	B 359,825	3,921,344	Nov. 25, 1975
B 340,833	3,925,208	Dec. 9, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 359,947	3,914,653	Oct. 21, 1975
B 342,423	3,925,334	Dec. 9, 1975	B 360,208	3,923,750	Dec. 2, 1975
B 342,886	3,923,507	Dec. 2, 1975	B 360,296	3,916,720	Nov. 4, 1975
B 343,136	3,919,453	Nov. 11, 1975	B 360,719	3,915,715	Oct. 28, 1975
B 343,240	3,925,693	Dec. 9, 1975	B 360,910	3,925,696	Dec. 9, 1975
B 343,506	3,916,021	Oct. 28, 1975	B 361,265	3,923,569	Dec. 2, 1975
B 343,577	3,921,165	Nov. 18, 1975	B 361,443	3,927,405	Dec. 16, 1975
B 344,479	3,924,042	Dec. 2, 1975	B 361,569	3,914,554	Oct. 21, 1975
B 345,060	3,916,018	Oct. 28, 1975	B 361,604	3,922,702	Nov. 25, 1975
B 345,384	3,916,146	Oct. 28, 1975	B 361,734	3,915,764	Oct. 28, 1975
B 345,422	3,914,392	Oct. 21, 1975	B 362,589	3,914,012	Oct. 21, 1975
B 345,527	3,927,365	Dec. 16, 1975	B 363,205	3,923,744	Dec. 2, 1975
B 345,567	3,913,985	Oct. 21, 1975	B 363,457	3,922,595	Nov. 25, 1975
B 346,165	3,913,293	Oct. 21, 1975	B 363,892	3,913,395	Oct. 21, 1975
B 346,210	3,916,142	Oct. 28, 1975	B 363,962	3,921,826	Nov. 25, 1975
B 346,350	3,915,824	Oct. 28, 1975	B 364,022	3,913,499	Oct. 21, 1975
B 346,487	3,927,406	Dec. 16, 1975	B 364,163	3,916,092	Oct. 28, 1975
B 346,585	3,913,820	Oct. 21, 1975	B 364,241	3,916,668	Nov. 4, 1975
B 346,613	3,923,545	Dec. 2, 1975	B 364,334	3,924,670	Dec. 9, 1975
B 346,901	3,915,583	Oct. 28, 1975	B 364,528	3,919,510	Nov. 11, 1975
B 348,083	3,923,774	Dec. 2, 1975	B 364,786	3,921,673	Nov. 25, 1975
B 348,383	3,923,452	Dec. 2, 1975	B 364,910	3,925,335	Dec. 9, 1975
B 348,495	3,914,654	Oct. 21, 1975	B 365,490	3,918,527	Nov. 11, 1975
B 348,558	3,914,109	Oct. 21, 1975	B 365,834	3,914,702	Oct. 21, 1975
B 349,141	3,915,363	Oct. 28, 1975	B 365,841	3,925,628	Dec. 9, 1975
B 349,177	3,914,033	Oct. 21, 1975	B 365,855	3,917,258	Nov. 4, 1975
B 349,231	3,915,831	Oct. 28, 1975	B 366,287	3,924,946	Dec. 9, 1975
B 349,321	3,916,103	Oct. 28, 1975	B 366,589	3,914,719	Oct. 21, 1975
B 349,948	3,914,557	Oct. 21, 1975	B 367,021	3,914,752	Oct. 21, 1975
B 350,025	3,927,415	Dec. 16, 1975	B 367,040	3,924,775	Dec. 9, 1975
B 350,143	3,924,419	Dec. 9, 1975	B 367,661	3,914,158	Oct. 21, 1975
B 350,219	3,917,802	Nov. 4, 1975	B 367,739	3,923,648	Dec. 2, 1975
B 350,245	3,914,331	Oct. 21, 1975	B 367,812	3,924,789	Dec. 9, 1975
B 350,523	3,924,726	Dec. 9, 1975	B 368,081	3,924,691	Dec. 9, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 368,387	3,924,923	Dec. 9, 1975	B 393,163	3,914,535	Oct. 21, 1975
B 368,392	3,913,812	Oct. 21, 1975	B 393,970	3,914,638	Oct. 21, 1975
B 368,397	3,914,677	Oct. 21, 1975	B 394,088	3,914,740	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975	B 394,188	3,924,591	Dec. 9, 1975
B 369,563	3,924,449	Dec. 9, 1975	B 394,300	3,914,159	Oct. 21, 1975
B 369,607	3,923,786	Dec. 2, 1975	B 394,712	3,916,306	Oct. 28, 1975
B 369,997	3,913,533	Oct. 21, 1975	B 395,478	3,922,577	Nov. 25, 1975
B 370,706	3,925,242	Dec. 9, 1975	B 395,496	3,919,435	Nov. 11, 1975
B 371,085	3,923,783	Dec. 2, 1975	B 395,671	3,920,418	Nov. 18, 1975
B 371,787	3,921,217	Nov. 18, 1975	B 395,889	3,913,190	Oct. 21, 1975
B 371,805	3,914,433	Oct. 21, 1975	B 396,025	3,913,869	Oct. 21, 1975
B 371,836	3,923,541	Dec. 2, 1975	B 396,551	3,921,929	Nov. 25, 1975
B 372,823	3,924,660	Dec. 9, 1975	B 397,027	3,923,736	Dec. 2, 1975
B 373,297	3,924,436	Dec. 9, 1975	B 397,527	3,913,488	Oct. 21, 1975
B 373,326	3,920,433	Nov. 18, 1975	B 397,990	3,914,848	Oct. 28, 1975
B 373,428	3,915,511	Oct. 28, 1975	B 398,262	3,913,481	Oct. 21, 1975
B 375,220	3,920,417	Nov. 18, 1975	B 398,551	3,924,924	Dec. 9, 1975
B 375,652	3,921,303	Nov. 25, 1975	B 398,597	3,913,743	Oct. 21, 1975
B 376,504	3,914,570	Oct. 21, 1975	B 398,625	3,920,996	Nov. 18, 1975
B 376,654	3,922,513	Nov. 25, 1975	B 399,292	3,914,810	Oct. 28, 1975
B 376,742	3,924,392	Dec. 9, 1975	B 399,304	3,919,567	Nov. 11, 1975
B 376,799	3,913,955	Oct. 21, 1975	B 399,349	3,925,694	Dec. 9, 1975
B 377,172	3,918,255	Nov. 11, 1975	B 399,766	3,915,667	Oct. 28, 1975
B 377,683	3,924,433	Dec. 9, 1975	B 400,080	3,925,163	Dec. 9, 1975
B 377,833	3,913,884	Oct. 21, 1975	B 400,293	3,923,719	Dec. 2, 1975
B 377,869	3,917,002	Nov. 4, 1975	B 400,310	3,915,507	Oct. 28, 1975
B 378,621	3,923,840	Dec. 2, 1975	B 401,133	3,924,443	Dec. 9, 1975
B 379,038	3,923,994	Dec. 2, 1975	B 401,992	3,924,898	Dec. 9, 1975
B 379,172	3,914,379	Oct. 21, 1975	B 402,065	3,925,413	Dec. 9, 1975
B 379,282	3,913,462	Oct. 21, 1975	B 402,555	3,914,688	Oct. 21, 1975
B 379,955	3,913,157	Oct. 21, 1975	B 403,140	3,913,486	Oct. 21, 1975
B 380,014	3,921,915	Nov. 25, 1975	B 403,355	3,913,352	Oct. 21, 1975
B 380,141	3,925,161	Dec. 9, 1975	B 403,990	3,914,684	Oct. 21, 1975
B 380,310	3,921,048	Nov. 18, 1975	B 403,996	3,916,016	Oct. 28, 1975
B 380,312	3,913,953	Oct. 21, 1975	B 404,290	3,924,918	Dec. 9, 1975
B 380,338	3,924,873	Dec. 9, 1975	B 404,437	3,915,200	Oct. 28, 1975
B 380,446	3,923,836	Dec. 2, 1975	B 405,136	3,915,565	Oct. 28, 1975
B 380,900	3,913,307	Oct. 21, 1975	B 405,137	3,915,566	Oct. 28, 1975
B 380,926	3,925,095	Dec. 9, 1975	B 405,160	3,924,821	Dec. 9, 1975
B 381,074	3,919,583	Nov. 11, 1975	B 405,248	3,926,294	Dec. 16, 1975
B 381,632	3,914,732	Oct. 21, 1975	B 405,305	3,922,111	Nov. 25, 1975
B 381,847	3,921,152	Nov. 18, 1975	B 405,360	3,913,403	Oct. 21, 1975
B 382,021	3,913,212	Oct. 21, 1975	B 405,495	3,924,577	Dec. 9, 1975
B 382,261	3,914,991	Oct. 28, 1975	B 405,938	3,920,109	Nov. 18, 1975
B 382,290	3,924,717	Dec. 9, 1975	B 406,065	3,914,199	Oct. 21, 1975
B 382,733	3,919,527	Nov. 11, 1975	B 406,357	3,924,529	Dec. 9, 1975
B 382,798	3,924,425	Dec. 9, 1975	B 407,736	3,924,463	Dec. 9, 1975
B 382,840	3,922,007	Nov. 25, 1975	B 407,357	3,924,614	Dec. 9, 1975
B 383,465	3,927,412	Dec. 16, 1975	B 407,728	3,925,240	Dec. 9, 1975
B 383,532	3,914,246	Oct. 21, 1975	B 408,487	3,924,046	Dec. 2, 1975
B 383,581	3,925,318	Dec. 9, 1975	B 408,749	3,914,116	Oct. 21, 1975
B 384,499	3,925,135	Dec. 9, 1975	B 409,026	3,925,497	Dec. 9, 1975
B 384,658	3,913,452	Oct. 21, 1975	B 409,220	3,915,648	Oct. 28, 1975
B 384,773	3,915,416	Oct. 28, 1975	B 409,251	3,922,620	Nov. 25, 1975
B 385,210	3,913,406	Oct. 21, 1975	B 409,657	3,927,362	Dec. 16, 1975
B 386,403	3,924,895	Dec. 9, 1975	B 409,816	3,921,317	Nov. 25, 1975
B 386,592	3,925,305	Dec. 9, 1975	B 410,062	3,923,855	Dec. 2, 1975
B 387,039	3,924,510	Dec. 9, 1975	B 410,168	3,914,717	Oct. 21, 1975
B 387,331	3,913,701	Oct. 21, 1975	B 411,145	3,914,168	Oct. 21, 1975
B 387,363	3,927,378	Dec. 16, 1975	B 411,356	3,919,649	Nov. 11, 1975
B 387,687	3,918,151	Nov. 11, 1975	B 411,483	3,925,196	Dec. 9, 1975
B 387,761	3,914,245	Oct. 21, 1975	B 411,633	3,914,741	Oct. 21, 1975
B 387,790	3,925,380	Dec. 9, 1975	B 412,516	3,927,417	Dec. 16, 1975
B 387,818	3,918,935	Nov. 11, 1975	B 412,619	3,925,292	Dec. 9, 1975
B 388,580	3,923,712	Dec. 2, 1975	B 412,867	3,924,587	Dec. 9, 1975
B 389,070	3,914,171	Oct. 21, 1975	B 413,006	3,914,850	Oct. 28, 1975
B 389,285	3,914,631	Oct. 21, 1975	B 413,546	3,924,314	Dec. 9, 1975
B 389,327	3,924,504	Dec. 9, 1975	B 414,129	3,925,484	Dec. 9, 1975
B 389,639	3,914,626	Oct. 21, 1975	B 414,288	3,925,537	Dec. 9, 1975
B 389,726	3,921,010	Nov. 18, 1975	B 415,113	3,915,717	Oct. 28, 1975
B 389,807	3,922,623	Nov. 25, 1975	B 415,124	3,915,944	Oct. 28, 1975
B 389,932	3,913,268	Oct. 21, 1975	B 415,845	3,925,076	Dec. 9, 1975
B 389,933	3,913,267	Oct. 21, 1975	B 415,847	3,914,208	Oct. 21, 1975
B 390,679	3,913,668	Oct. 21, 1975	B 415,957	3,925,635	Dec. 9, 1975
B 390,732	3,913,878	Oct. 21, 1975	B 415,977	3,927,359	Dec. 16, 1975
B 391,184	3,914,214	Oct. 21, 1975	B 416,598	3,923,473	Dec. 2, 1975
B 391,210	3,914,220	Oct. 21, 1975	B 416,832	3,924,975	Dec. 9, 1975
B 391,437	3,915,416	Oct. 28, 1975	B 416,710	3,923,746	Dec. 2, 1975
B 391,509	3,925,175	Dec. 9, 1975	B 416,933	3,924,968	Dec. 9, 1975
B 391,675	3,916,017	Oct. 28, 1975	B 417,299	3,918,235	Nov. 11, 1975
B 392,154	3,923,809	Dec. 2, 1975	B 418,121	3,925,023	Dec. 9, 1975
B 392,242	3,926,636	Dec. 16, 1975	B 418,153	3,925,251	Dec. 9, 1975
B 392,696	3,916,175	Oct. 28, 1975	B 418,302	3,913,252	Oct. 21, 1975
B 392,732	3,914,903	Oct. 21, 1975	B 419,327	3,921,197	Nov. 18, 1975
B 392,753	3,916,341	Oct. 28, 1975	B 419,481	3,924,970	Dec. 9, 1975
B 392,894	3,914,763	Oct. 21, 1975	B 420,016	3,914,572	Oct. 21, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 420,148	3,927,414	Dec. 16, 1975	B 435,343	3,919,244	Nov. 11, 1975
B 420,514	3,923,929	Dec. 2, 1975	B 435,844	3,925,170	Dec. 9, 1975
B 420,568	3,925,069	Dec. 9, 1975	B 437,173	3,924,627	Dec. 9, 1975
B 421,026	3,914,785	Oct. 21, 1975	B 437,172	3,913,251	Oct. 21, 1975
B 421,362	3,924,817	Dec. 9, 1975	B 437,195	3,914,618	Oct. 21, 1975
B 421,383	3,925,047	Dec. 9, 1975	B 437,450	3,922,479	Nov. 25, 1975
B 421,797	3,914,023	Oct. 21, 1975	B 438,053	3,916,013	Oct. 28, 1975
B 422,467	3,924,804	Dec. 9, 1975	B 438,706	3,925,050	Dec. 9, 1975
B 422,949	3,921,873	Nov. 25, 1975	B 439,168	3,919,676	Nov. 11, 1975
B 424,415	3,919,458	Nov. 11, 1975	B 439,669	3,921,499	Nov. 25, 1975
B 424,462	3,920,522	Nov. 18, 1975	B 440,898	3,921,789	Nov. 25, 1975
B 424,572	3,924,979	Dec. 9, 1975	B 441,024	3,913,629	Oct. 21, 1975
B 424,748	3,924,395	Dec. 9, 1975	B 441,416	3,913,851	Oct. 21, 1975
B 425,035	3,914,025	Oct. 21, 1975	B 442,280	3,914,054	Oct. 21, 1975
B 425,345	3,922,015	Nov. 25, 1975	B 442,859	3,918,570	Nov. 11, 1975
B 425,470	3,923,796	Dec. 2, 1975	B 442,919	3,925,483	Dec. 9, 1975
B 425,539	3,916,742	Nov. 4, 1975	B 445,471	3,914,711	Oct. 21, 1975
B 425,541	3,914,051	Oct. 21, 1975	B 445,740	3,923,612	Dec. 2, 1975
B 425,572	3,923,822	Dec. 2, 1975	B 448,571	3,924,760	Dec. 9, 1975
B 427,631	3,921,433	Nov. 25, 1975	B 449,647	3,916,797	Nov. 4, 1975
B 428,177	3,914,624	Oct. 21, 1975	B 450,499	3,920,526	Nov. 18, 1975
B 428,795	3,921,056	Nov. 18, 1975	B 450,546	3,924,417	Dec. 9, 1975
B 429,442	3,923,485	Dec. 2, 1975	B 450,927	3,913,844	Oct. 21, 1975
B 430,106	3,918,941	Nov. 11, 1975	B 455,520	3,922,543	Nov. 25, 1975
B 430,140	3,922,084	Nov. 25, 1975	B 455,775	3,914,356	Oct. 21, 1975
B 430,798	3,918,204	Nov. 11, 1975	B 456,346	3,914,531	Oct. 21, 1975
B 430,944	3,922,096	Nov. 25, 1975	B 461,872	3,919,586	Nov. 11, 1975
B 432,373	3,919,670	Nov. 11, 1975	B 467,684	3,915,119	Oct. 28, 1975
B 433,587	3,914,567	Oct. 21, 1975	B 468,198	3,925,340	Dec. 9, 1975

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF DECEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Austin, George K., Jr. Dental handpiece control. Re. 28,649, Cl. 32-22.000.

Bell Telephone Laboratories, Incorporated: *See*—
Murphy, Bernard Thomas, Re. 28,653.

Bildfell, Johann T., to Trail-Air Scoop Limited. Aerodynamic deflector. Re. 28,652, Cl. 296-1.00S.

Carlson, Gordon S.: *See*—
Crowley, George C.; and Carlson, Gordon S., Re. 28,656.

Crowley, George C.; and Carlson, Gordon S., to Northern Electric Company. Thermostatless blanket control circuit. Re. 28,656, Cl. 219-212.000.

FMC Corporation: *See*—
Welborn, Robert E., Re. 28,651.

Haldor Topsoe A/S: *See*—
Rostrup-Nielsen, Jens Richard, Re. 28,655.

Helmes, Christiaan T.: *See*—
Helmes, Gerardus P.; Helmes, P. M.; Helmes, Christiaan T.; Helmes, Johan P. H.; and Helmes, Franciscus J., Re. 28,654.

Helmes, Franciscus J.: *See*—
Helmes, Gerardus P.; Helmes, P. M.; Helmes, Christiaan T.; Helmes, Johan P. H.; and Helmes, Franciscus J., Re. 28,654.

Helmes, Gerardus P.; Helmes, P. M.; Helmes, Christiaan T.; Helmes, Johan P. H.; and Helmes, Franciscus J., to Helmes Machinefabriek N.V. Method for gluing a strip of material against the side of a flat work piece, like a table leaf, and a device for performing this method. Re. 28,654, Cl. 156-212.000.

Helmes, Johan P. H.: *See*—
Helmes, Gerardus P.; Helmes, P. M.; Helmes, Christiaan T.; Helmes, Johan P. H.; and Helmes, Franciscus J., Re. 28,654.

Helmes Machinefabriek N.V.: *See*—
Helmes, Gerardus P.; Helmes, P. M.; Helmes, Christiaan T.; Helmes, Johan P. H.; and Helmes, Franciscus J., Re. 28,654.

Helmes, P. M.: *See*—
Helmes, Gerardus P.; Helmes, P. M.; Helmes, Christiaan T.; Helmes, Johan P. H.; and Helmes, Franciscus J., Re. 28,654.

Koleszar, Frank: *See*—
Sisk, George W., Jr.; Miller, Arthur W.; and Koleszar, Frank, Re. 28,650.

Miller, Arthur W.: *See*—
Sisk, George W., Jr.; Miller, Arthur W.; and Koleszar, Frank, Re. 28,650.

Murphy, Bernard Thomas, to Bell Telephone Laboratories, Incorporated. Method of fabricating semiconductor devices. Re. 28,653, Cl. 148-175.000.

Northern Electric Company: *See*—
Crowley, George C.; and Carlson, Gordon S., Re. 28,656.

Rostrup-Nielsen, Jens Richard, to Haldor Topsoe A/S. Process for the production of a reforming catalyst. Re. 28,655, Cl. 252-466.00J.

Sisk, George W., Jr.; Miller, Arthur W.; and Koleszar, Frank, to Whirlpool Corporation. Adjustable speed air drive-air sweep for air conditioner. Re. 28,650, Cl. 98-94.000.

Trail-Air Scoop Limited: *See*—
Bildfell, Johann T., Re. 28,652.

Welborn, Robert E., to FMC Corporation. Stump removal machine. Re. 28,651, Cl. 144-2.00N.

Whirlpool Corporation: *See*—
Sisk, George W., Jr.; Miller, Arthur W.; and Koleszar, Frank, Re. 28,650.

LIST OF PLANT PATENTEES

Flemer, William III, to Treesearch. Flowering pear tree. 3,815, 12–16–75, Cl. 36.

Flemer, William III, to Treesearch. Maple tree. 3,817, 12–16–75, Cl. 51.

Treesearch: *See*—
Flemer, William III. 3,815.
Flemer, William III. 3,817.

Van Staaveren, Maurits C. Carnation plant "Bellita." 3,816, 12–16–75, Cl. 70.

LIST OF DESIGN PATENTEES

AB Gustavsbergs Fabriker: *See*—
Juhlin, Sven-Eric. 238,039.

Amend, Edith C. Refillable fluid container used to apply heat or cold for therapeutic purposes. 238,105, 12–16–75. Cl. D83—1.

Amerock Corp.: *See*—
Tegner, Raymond U. H. 238,035.

Anker, Johann F. Blade for multi purpose gardening tool. 238,042, 12–16–75, Cl. D8—9.

Arblaster, Dennis. Resuscitation board. 238,106, 12–16–75. Cl. D83—1.

Baus, Andre E. J., to The Goodyear Tire & Rubber Co. Tire. 238,061, 12–16–75, Cl. D12—148.

Bertoncel, Anton. Switch cover. 238,048, 12–16–75, Cl. D8—181.

Bic Pen Corp.: *See*—
Marynissen, William E. 238,068.

Boris, Charles C. Cabinet cover. 238,052, 12–16–75, Cl. D9—259.

Bourassa, Joseph R., and M. Lopez, to Parker Hannifin Corp. Windshield wiper blade unit. 238,062, 12–16–75, Cl. D12—155.

Brainard, James L., and R. J. Palm, to Whittaker Corp. Wheel. 238,064, 12–16–75, Cl. D12—210.

Caropresi. Frederick V., to Pease Co. Panel for a door. 238,067, 12–16–75, Cl. D13—1.

Cassina, Cesare, to Centro Cassina S.r.l. Armchair. 238,033, 12–16–75, Cl. D6—71.

Citic Industries: *See*—
Cohen, William J. 238,017.

Citizen Watch Co.: *See*—
Funahashi, Yukinobu. 238,054.

Clement, Richard H. Wheel center. 238,063, 12–16–75, Cl. D12—209.

Cohen, William J., to Citic Industries. Sport shoe. 238,017 12–16–75, Cl. D2—310.

Cook, Fern L. Boat hull. 238,059, 12–16–75, Cl. D12—62.

Cook, Raymon W. Golf putter head. 238,087, 12–16–75, Cl. D34—5.

Cooke, Gladys E. Tongue cleaner. 238,108, 12–16–75, Cl D83—12.

Comalco (J & S) Pty. Ltd.: *See*—
Howells, Ronald McK. 238,066.

Cosco, Inc.: *See*—
Loturco, Raymond A. 238,038.

Cox, Sam G. Shag rug carpet cleaner head. 238,041, 12–16–75, Cl. D7—173.

Cuthbertson, Eugene R. Combined cigarette holder and removable support. 238,083, 12–16–75, Cl. D27—7.

Dazey Products Co.: *See*—
McNair, Samuel L. 238,104.

Delin, Fred O. Lighting fixture. 238,096, 12–16–75, Cl. D48—31.

Dimensionetix, Inc.: *See*—
Ganger, Richard J. 238,070.
Ganger, Richard J. 238,071.
Ganger, Richard J. 238,072.
Ganger, Richard J. 238,073.
Gruber, George S. 238,074.

Dolan, William S., to Gruen Industries, Inc. Numeral font or similar article. 238,102, 12–16–75, Cl. D64—12.

Driscoll, James A. Combined tail light and support bracket for boat trailers. 238,097, 12–16–75, Cl. D48—32.

Dubner, Robert B., and H. Bienenfeld. Pressure pump for tennis ball canisters. 238,069, 12–16–75, Cl. D23—15.

Duncan, Thomas W. Tie rack. 238,032, 12–16–75, Cl. D6—251.

Dunlop Ltd.: *See*—
Majek, Mieczyslaw. 238,044.
Sakaki, Nobuyuki. 238,060.

Eisen, Leonard. Ornamental design for chair. 238,034, 12–16–75, Cl. D6—74.

Emerson Electric Co.: *See*—
Tuggle, Lloyd H. 238,103.

Entin, Leonard, and L. A. Gainsboro, to Opus Inc. Hanger for a plant container. 238,036, 12–16–75, Cl. D6—137.
Ervin, Roger N. Lighting fixture. 238,094, 12–16–75, Cl. D48—31.
Ervin, Roger N. Lighting fixture. 238,095, 12–16–75, Cl. D48—31.
Fier, Edward J., Jr. Container apparatus. 238,051, 12–16–75, Cl. D9—240.
Findeisen, John L. Cover for golf club carrying case. 238,086, 12–16–75, Cl. D34—5.
Fink, David H. Portable radio. 238,098, 12–16–75, Cl. D56—4.
Foster, Jack B., and J. E. Antes, to Super Seer Corp. Spirit level inclinometer. 238,056, 12–16–75, Cl. D10—69.
Funahashi, Yukinobu, to Citizen Watch Co. Clock. 238,054, 12–16–75, Cl. D10—24.
Ganger, Richard J., to Dimensionetix, Inc. Combined vanity top and basin. 238,070, 12–16–75, Cl. D23—58.
Ganger, Richard J., to Dimensionetix, Inc. Bath tub. 238,071, 12–16–75, Cl. D23—55.
Ganger, Richard J., to Dimensionetix, Inc. Bathtub. 238,072, 12–16–75, Cl. D23—55.
Ganger, Richard J., to Dimensionetix, Inc. Lavatory. 238,073, 12–16–75, Cl. D23—58.
Gardisette International AG. : *See*—
Schroeder, Peter E. 238,092.
Schroeder, Peter E. 238,093.
General Electric Co. : *See*—
Newgard, Jon M., and Schultz. 238,076.
Gold, Donald B., to K.I.S.S. Industries, Inc. Cocktail table. 238,020. 12–16–75, Cl. D6—27.
Gold, Donald B., to K.I.S.S. Industries, Inc. End table. 238,028, 12–16–75, Cl. D6—179.
Gold, Donald B., to K.I.S.S. Industries, Inc. Coffee table. 238,037, 12–16–75, Cl. D6—147.
Goodyear Tire & Rubber Co., The : *See*—
Baus, Andre E. J. 238,061.
Goto, Kenjiro. Cigarette lighter. 238,084, 12–16–75, Cl. D27—42.
Grosfillex S.A.R.L. : *See*—
Grosfillex, Raymond. 238,088.
Grosfillex, Raymond, to Grosfillex S.A.R.L. Vat for indoor garden. 238,088, 12–16–75, Cl. D35—3.
Gruber, George S., to Dimensionetix, Inc. Bath tub. 238,074, 12–16–75, Cl. D23—55.
Gruen Industries, Inc. : *See*—
Dolan, William S. 238,102.
Gulf & Western Mfg. Co. : *See*—
Weyrauch, George L. 238,058.
Hanson, Alden B., and C. A., to Hanson Industries, Inc. Ski boot. 238,016, 12–16–75, Cl. D2—276.
Harding, Hugh H. Pendant or similar article. 238,091, 12–16–75, Cl. D45—19.
Hardy, Richard D. Table for barbecue grill. 238,040, 12–16–75 Cl. D7—107.
Harris, Ulysses, to Ten-O-Feb., Inc. Cabinet for covering lavatory pipes. 238,075, 12–16–75, Cl. D23—59.
Hanson Industries, Inc. : *See*—
Hanson, Alden B., and C. A. 238,016.
Hart, Donald G. Tool box. 238,113, 12–16–75, Cl. D87—1.
Harvey, Wilfred G. Playing surface module for athletic activites such as tennis court, swimming pool areas, and the like. 238,065, 12–16–75, Cl. D13—1.
Heribertson, Per Erik Edward, and R. B. Andrew, to International Standard Electric Corp. Telephone set. 238,079, 12–16–75, Cl. D26—14.
Heros, Ricardo J., to Richards Mfg. Co., Inc. Cement injection gun for use in total joint surgeries. 238,107, 12–16–75, Cl. D83—12.
Hertzel, Richard R. Window box support. 238,040, 12–16–75, Cl. D8—242.
Howard Display's Inc. : *See*—
Howard, Fred. 238,029.
Howard, Fred, to Howard Display's Inc. Carpet sample display stand. 238,029, 12–16–75, Cl. D6—186.
Howells, Ronald M., to Comalco (J & S) Pty. Ltd. Door. 238,066, 12–16–75, Cl. D13—1.
Hutton, John R. Tire chaining tool. 238,045, 12–16–75, Cl. D8—31.
ICF de Padova S.r.l. : *See*—
Mazzucconi, Vittorio. 238,023.
International Standard Electric Corp. : *See*—
Heribertson, Per Erik Edward, and Andrew. 238,079.
Johnson, Seward W., and J. Moore. Clock. 238,053, 12–16–75, Cl. D10—7.
Jones, David R. Liquor dispenser. 238,114, 12–16–75, Cl. D94—3.
Juhlin, Sven-Eric, to AB Gustavsbergs Fabrier. Combined child's dish and base therefor. 238,039, 12–16–75, Cl. D7—23.
K.I.S.S. Industries, Inc. : *See*—
Gold, Donald B. 238,020.
Gold, Donald B. 238,028.
Gold, Donald B. 238,037.
Kabushiki Kaisha Daini Seikosha : *See*—
Seshimo, Norio. 238,055.
Kitson, Gerald L. Poultry feeder trough. 238,085, 12–16–75, Cl. D30—13.
Leffler, Dennis F., and D. M. Truette. Treatment chair. 238,019, 12–16–75, Cl. D6—22.
Levine, Aaron J. Plumbing cleanout device. 238,046, 12–16–75, Cl. D8—88.
Lorge, Maurice L. Combined room divider and closable bar. 238,026, 12–16–75, Cl. D6—144.
Lorge, Maurice L. Combined room divider and closable bar. 238,027. 12–16–75, Cl. D6—144.
Loturco, Raymond A., to Cosco, Inc. High chair tray. 238,038, 12–16–75, Cl. D6—199.
Mackie, Don A. Necktie. 238,018, 12–16–75, Cl. D2—351.
Majek, Mieczyslaw, to Dunlop Ltd. Tool used in separating a tire bead from its seat on a wheel. 238,044, 12–16–75, Cl. D8—31.
Marotta, Vincent G., to North American Systems, Inc. Coffee brewer. 238,115, 12–16–75, Cl. D94—3.
Marvaissen, William E., to Bic Pen Corp. Marking implement. 238,068, 12–16–75, Cl. D19—45.
Matthews, James C. Switch for TV cable and antenna. 238,082, 12–16–75, Cl. D26—13.
Mazzucconi, Vittorio, to ICF de Padova S.r.l. Divan. 238,023, 12–16–75, Cl. D6—62.
McNair, Samuel L., to Dazey Products Co. Combined vibrator and cushion. 238,104, 12–16–75, Cl. D83—1.
Meroni, Giuliandrea. Door handle with a lock-actuating push button or similar article. 238,047, 12–16–75, Cl. D8—147.
Minsker, Lawrence D. Folding chair. 238,021, 12–16–75, Cl. D6—41.
Monarch Marking Systems, Inc. : *See*—
Mulholland, Robert P. 238,101.
Mulholland, Robert P., to Monarch Marking Systems, Inc. Combined label printer and applicator. 238,101, 12–16–75, Cl. D64—10.
Nash, Stanley P. Seat. 238,024, 12–16–75, Cl. D6—63.
Newgard, Jon M., and C. F. Schultz, to General Electric Company. Wall mounted housing for an air conditioner or similar article. 238,076, 12–16–75, Cl. D23—141.
North American Systems, Inc. : *See*—
Marotta, Vincent G. 238,115.
Nowa, Ralph M., to Tucker Cosco, Inc. Utility case. 238,112, 12–16–75, Cl. D87—1.
Opus Inc. : *See*—
Entin, Leonard, and Gainsboro. 238,036.
Orion Industries, Inc. : *See*—
Shanklin, Donald J. 238,043.
Owens-Illinois, Inc. : *See*—
Schweizer, Peter L. 238,050.
Parker Hannifin Corp. : *See*—
Bourassa, Joseph R., and Lopez. 238,062.
Payne, C. Lee, Jr., and V. J. Gambello, to Sea Pines Co. Rocking chair. 238,022, 12–16–75, Cl. D6—49.
Pearsall, Duane D., and A. A. Mayer, to Statitrol Corp. Fire detector. 238,057, 12–16–75, Cl. D10—106.
Pease Co. : *See*—
Caropresi, Frederick V. 238,067.
Persson, Roger, to Kooperativa Forbundet. Container for paper rolls. 238,025, 12–16–75, Cl. D6—96.
Porter, Paul W., to Sperry Univac Division, Sperry Rand Corp. Electromechanical storage and retrieval unit. 238,080, 12–16–75, Cl. D26—3.
Poulin, Eugene A. Pendant or similar article. 238,089, 12–16–75, Cl. D45—17.
Poulin, Eugene A. Pendant or similar article. 238,090, 12–16–75, Cl. D45—17.
Pulos, Arthur J., to Welch Allyn, Inc., Otoscope. 238,099, 12–16–75, Cl. D57—1.
Pulos, Arthur J., to Welch Allyn, Inc. Ophthalmoscope. 238,100. 12–16–75, Cl. D57—1.
Richard Mfg. Co., Inc. : *See*—
Heros, Ricardo J. 238,107.
Sakaki, Nobuyuki, to Dunlop Ltd. Tire for a vehicle wheel. 238,060, 12–16–75, Cl. D12—146.
Schroeder, Peter E., to Gardisette International AG. Curtain pattern. 238,092. 12–16–75, Cl. D47—6.
Schroeder, Peter E., to Gardisette International AG. Curtain pattern (No. 510). 238,093, 12–16–75, Cl. D47—6.
Schweizer, Peter L., to Owens-Illinois, Inc. Combined cruet and stopper. 238,050, 12–16–75, Cl. D9—156.
Sea Pines Co. : *See*—
Payne, C. Lee, Jr., and Gambello. 238,022.
Seshimo, Norio, to Kabushiki Kaisha Daini Seikosha. Watch case. 238,055, 12–16–75, Cl. D10—38.
Shanklin, Donald J., to Orion Industries, Inc. Adjustable oil filter wrench. 238,043, 12–16–75, Cl. D8—22.
Shyers, Richard. Holder for magnetic tape cassettes. 238,110, 12–16–75, Cl. D87—1.
Shyers, Richard. Magnetic tape cassette holder. 238,111, 12–16–75, Cl. D87—1.
Sperry Univac Division, Sperry Rand Corp. : *See*—
Porter, Paul W. 238,080.
Statitrol Corp. : *See*—
Pearsall, Duane D., and Mayer. 238,057.
Sturrock, James C., to Robert N. Fink. Remote station for dictating equipment. 238,081, 12–16–75, Cl. D26—14.
Super Seer Corp. : *See*—
Foster, Jack B., and Antes. 238,056.
Taylor Industries, Inc. : *See*—
Taylor, Philip W. 238,077.
Taylor, Philip W., to Taylor Industries, Inc. Wiring duct. 238,077, 12–16–75, Cl. D26—1.
Tegner, Raymond U. H., to Amerock Corp. Towel ring. 238,035, 12–16–75, Cl. D6—99.
Ten-O-Feb., Inc. : *See*—
Harris, Ulysses. 238,075.
Tucker Cosco, Inc. : *See*—
Nowak, Ralph M. 238,112.
Tuggle, Lloyd H., to Emerson Electric Co. Power chain saw engine assembly. 238,103, 12–16–75, Cl. D77—1.
Vitetta, Michael G. Combined nozzle and comb for hair dryers. 238,109. 12–16–75, Cl. D8C—10.
Welch Allyn, Inc. : *See*—
Pulos, Arthur J. 238,099–100.
Welton, Gerry D. Stackable chair body. 238,030, 12–16–75, Cl. D6—197.
Welton, Gerry D. Sling chair body. 238,031, 12–16–75, Cl. D6—197.
Weyrauch, George L., to Gulf & Western Mfg. Co. Handtruck. 238,058, 12–16–75, Cl. D12—34.
Whittaker Corp. : *See*—
Brainard, James L., and Palm. 238,064.
Wilson, John H. Tape controller for magnetic tape decks. 238,078,, 12–16–75, Cl. D26—5.

CLAS
3R
81
CLAS
1.912
13
CLAS
7
114
147
166
182
183
249
251
CLAS
13
348WB
CLAS
12
14
115.5
116R
155.1
169
174
189
CLAS
1D
2R
319
331
CLASS
1
CLASS
3.53
23
184
250.42
CLASS
18
60
63
71
CLASS
48
98
CLASS
54R
CLASS
230R
232R
253PC
254E
255E
259
288FC
301SP
CLASS
20TT
30.5R
75
81PE
90PR
201C
205.15R
205.16C
205.16D
208A
243K
252R
CLASS
1
9
18.5
CLASS
4R
CLASS
78
96
175

CLASSIFICATION OF PATENTS

ISSUED DECEMBER 16, 1975

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

3R 3,925,821
3,925,822
81 3,925,823

CLASS 3

1.912 3,925,824
13 3,925,825

CLASS 4

7 3,925,826
114 3,925,827
147 3,925,828
166 3,925,829
182 3,925,830
183 3,925,831
249 3,925,832
251 3,925,833

CLASS 5

13 3,925,834
348WB 3,925,835

CLASS 8

12 3,926,546
14 3,926,547
115.5 3,926,548
3,926,551
116R 3,926,549
3,926,550
155.1 3,926,552
169 3,926,553
174 3,926,554
189 3,926,555

CLASS 9

1D 3,925,836
2R 3,925,837
319 3,925,838
331 3,925,839

CLASS 14

1 3,925,840

CLASS 15

3.53 3,925,842
23 3,925,841
184 3,925,843
250.42 3,925,844

CLASS 17

18 3,925,845
60 3,925,846
63 3,925,847
71 3,925,848

CLASS 19

48 3,925,849
98 3,925,850

CLASS 21

54R 3,926,556

CLASS 23

230R 3,926,558
3,926,559
232R 3,926,561
253PC 3,926,562
254E 3,926,560
255E 3,926,563
259 3,926,564
288FC 3,926,565
301SP 3,926,566

CLASS 24

20TT 3,925,851
30.5R 3,925,852
75 3,925,853
81PE 3,925,854
90PR 3,925,855
201C 3,925,856
205.15R 3,925,857
205.16C 3,925,859
205.16D 3,925,858
208A 3,925,860
243K 3,925,861
252R 3,925,862

CLASS 26

1 3,925,863
9 3,925,864
18.5 3,925,865

CLASS 28

4R 3,925,866

CLASS 29

78 3,925,867
96 3,925,868
175 3,925,869
182.5 3,926,567
3,926,568
194 3,926,569
195 3,926,570
3,926,571
196.2 3,926,572
197 3,926,573
3,926,574
200J 3,925,870
239 3,925,871
267 3,925,872
271 3,925,873
282 3,925,874
509 3,925,875
3,925,876
568 3,925,877
3,925,878
572 3,925,879
578 3,925,880
597 3,925,881
599 3,925,882
600 3,925,883
603 3,925,884
605 3,925,885
628 3,925,886

CLASS 30

4R 3,925,887
29.5 3,925,888
43.8 3,925,889
141 3,925,890
362 3,925,891

CLASS 32

10A 3,925,892
14A 3,925,893
14B 3,925,894
15 3,925,895
22 Re.28,649
40R 3,925,896

CLASS 33

1A 3,925,897
27C 3,925,898
75 3,925,899
81 3,925,900
137R 3,925,901
257 3,925,902

CLASS 34

9 3,925,903
10 3,925,904
16 3,925,905
18 3,925,906
20 3,925,907
58 3,925,908

CLASS 35

9A 3,925,909

CLASS 36

2.5AL 3,925,911
3R 3,925,912
11.5 3,925,913
3,925,914
3,925,915
71 3,925,916

CLASS 40

31 3,925,917
42 3,925,918

CLASS 43

4 3,925,919
43.12 3,925,920
3,925,921
66 3,925,922

CLASS 44

1R 3,926,575
10H 3,926,576
51 3,926,577
58 3,926,578
62 3,926,579
68 3,926,580
3,926,581

CLASS 46

7 3,925,923
201 3,925,924
213 3,925,925

CLASS 47

1.2 3,925,926
1.5 3,925,927
17 3,925,928

CLASS 48

62 3,926,582
214 3,926,583
3,926,584

CLASS 49

35 3,925,929
124 3,925,930
227 3,925,931
3,925,932
409 3,925,933
504 3,925,934

CLASS 51

8HD 3,925,935
118 3,925,936
145R 3,925,937
295 3,926,585

CLASS 52

22 3,925,938
36 3,925,939
81 3,925,940
82 3,925,941
86 3,925,942
108 3,925,943
134 3,925,944
171 3,925,945
180 3,925,946
208 3,925,947
481 3,925,948
581 3,925,949
585 3,925,950
693 3,925,951
714 3,925,952
741 3,925,953
752 3,925,954
758D 3,925,955
3,925,956

CLASS 53

6 3,925,957
21FW 3,925,958
28 3,925,959
78 3,925,960
89 3,925,961
112R 3,925,965
124B 3,925,962
182 3,925,963
183 3,925,964
212 3,925,966
385 3,925,967

CLASS 55

10 3,926,586
12 3,926,587
52 3,926,588
67 3,926,589
68 3,926,590
3,926,591
84 3,926,592
96 3,926,593
159 3,926,594
302 3,926,595
304 3,926,596
338 3,926,597
385 3,926,598
387 3,926,599

CLASS 56

13.3 3,925,968
13.9 3,925,969
14.7 3,925,970
208 3,925,971
320.2 3,925,972
328R 3,925,973
346 3,925,974

CLASS 57

34R 3,925,975
140R 3,925,976

CLASS 58

4A 3,925,977
23R 3,925,978

CLASS 60

39.07 3,925,979
39.29 3,925,980
39.77 3,925,981
242 3,925,982
265 3,925,983
370 3,925,984
371 3,925,985
398 3,925,986
464 3,925,987
539 3,925,988
602 3,925,989
644 3,925,990

CLASS 61

.5 3,925,992
1F 3,925,991
36A 3,925,993
39 3,925,994
45B 3,925,996
45D 3,925,995
46.5 3,925,997
53.64 3,925,998
64 3,925,999
3,926,002
72.4 3,926,003
72.6 3,926,004
85 3,926,005

CLASS 62

66 3,926,006
121 3,926,000
137 3,926,007
200 3,926,008
296 3,926,009
378 3,926,001
401 3,926,010
514 3,926,011

CLASS 64

19 3,926,012

CLASS 65

1 3,926,600
31 3,926,601
33 3,926,602
3,926,603
60 3,926,604
65A 3,926,605
135 3,926,606
136 3,926,607

CLASS 66

40 3,926,013
84A 3,926,014
147 3,926,015
157 3,926,016
195 3,926,017

CLASS 70

19 3,926,018
85 3,926,019
278 3,926,021

CLASS 71

1 3,926,608
31 3,926,609
34 3,926,610
94 3,926,611
100 3,926,612
118 3,926,613

CLASS 72

8 3,926,024
24 3,926,022
60 3,926,023
84 3,926,025
90 3,926,026
239 3,926,027
319 3,926,028
342 3,926,029
368 3,926,030
407 3,926,031
419 3,926,032
451 3,926,033

CLASS 73

6 3,926,048
15R 3,926,034
32A 3,926,035
37 3,926,036
53 3,926,037
61.1R 3,926,038
67.7 3,926,039
67.8S 3,926,040
85 3,926,041
88A 3,926,042
104 3,926,044
114 3,926,045
117 3,926,043
133R 3,926,046
151 3,926,047
194EM 3,926,049
205D 3,926,050
277 3,926,051
336.5 3,926,052
351 3,926,053
382 3,926,054
398AR 3,926,055
3,926,056
401 3,926,057
432R 3,926,058
510 3,926,059

CLASS 74

5.1 3,926,060
22R 3,926,061
89 3,926,062
217B 3,926,020
242.11A 3,926,063
421R 3,926,064
424 3,926,065
435 3,926,066
461 3,926,067
473R 3,926,068
492 3,926,069
498 3,926,070
567 3,926,071
665N 3,926,072
753 3,926,073
857 3,926,074
867 3,926,075

CLASS 75

.5BA 3,926,617
1 3,926,614
3 3,926,615
3,926,616
60 3,926,618
3,926,619
122 3,926,620
124 3,926,621
126G 3,926,622
129 3,926,623
130.5 3,926,624

CLASS 81

3.41 3,926,076
126 3,926,077

CLASS 82

2.5 3,926,078
36A 3,926,079

CLASS 83

15 3,926,080
96 3,926,081
140 3,926,082
637 3,926,083
698 3,926,084
718 3,926,085
801 3,926,086

CLASS 84

345 3,926,087
462 3,926,088

CLASS 85

5CP 3,926,089
33 3,926,090

CLASS 90

1.4 3,926,091

CLASS 91

378 3,926,092
391R 3,926,093

CLASS 92

63 3,926,094
157 3,926,095

CLASS 93

49M 3,926,096
58.2R 3,926,097
81R 3,926,098

CLASS 96

1R 3,926,625
3,926,626
3,926,627
3,926,628
1.5 3,926,629
27E 3,926,630
29D 3,926,631
66.5 3,926,632
67 3,926,436
68 3,926,633
100 3,926,634
114 3,926,635
115P 3,926,640
3,926,641
3,926,643
115R 3,926,636
3,926,637
3,926,638
3,926,639
3,926,642

CLASS 98

2.05 3,926,099
2.14 3,926,100
33R 3,926,101
94 Re.28,650
102 3,926,102
115SB 3,926,103
115VM 3,926,104

CLASS 99

423 3,926,105
447 3,926,106

CLASS 100

45 3,926,107
177 3,926,108

CLASS 101

90 3,926,109
92 3,926,110
116 3,926,111
123 3,926,112
128.1 3,926,113
142 3,926,114
148 3,926,115
3,926,116
211 3,926,117
246 3,926,118

CLASS 102

24R 3,926,119
70.2P 3,926,120
3,926,121
79 3,926,122

CLASS 104

7R 3,926,123
26A 3,926,124
94 3,926,125
130 3,926,126

CLASS 105

26R 3,926,128
224R 3,926,127

CLASS 106

15AF 3,926,644
21 3,926,645
35 3,926,646
39.5 3,926,647
39.6 3,926,648
47R 3,926,649
88 3,926,650
100 3,926,651
118 3,926,652
119 3,926,653
137 3,926,654
243 3,926,655
272 3,926,656
286 3,926,657
287 3,926,658
291 3,926,659
300 3,926,660

CLASS 110

7B 3,926,129
10 3,926,130

CLASS 111

6 3,926,131

CLASS 112

79A 3,926,132
158R 3,926,133

CLASS 114

74R 3,926,134
3,926,135
123 3,926,136
209 3,926,137

CLASS 115

29 3,926,138

CLASS 116

26 3,926,139
85 3,926,140
114R 3,926,141
116 3,926,142
118R 3,926,143
124R 3,926,144

CLASS 118

7 3,926,145
24 3,926,146

49.1 3,926,147
247 3,926,148

CLASS 119

1 3,926,149

CLASS 122

250R 3,926,150

CLASS 123

8.05 3,926,151
8.09 3,926,152
32EA 3,926,153
3,926,154
32SJ 3,926,169
41.68 3,926,155
41.69 3,926,156
73D 3,926,157
75B 3,926,158
90.11 3,926,159
103E 3,926,160
119A 3,926,161
139AZ 3,926,163
139A 3,926,162
140FG 3,926,164
148E 3,926,165
3,926,557
179L 3,926,167
180R 3,926,168
193P 3,926,166

CLASS 124

8 3,926,170

CLASS 126

21A 3,926,171
39E 3,926,172
110R 3,926,173
121 3,926,174

CLASS 127

19 3,926,661
48 3,926,662

CLASS 128

1R 3,926,175
1.2 3,926,176
2S 3,926,177
3,926,178
2.05N 3,926,179
32 3,926,180
68 3,926,181
75 3,926,182
78 3,926,183
79 3,926,184
132D 3,926,185
165 3,926,186
232 3,926,187
260 3,926,188
287 3,926,189
3,926,190
3,926,191
303R 3,926,192
335 3,926,193
339 3,926,194
346 3,926,195
351 3,926,196
419PG 3,926,198
419PT 3,926,197

CLASS 131

187 3,926,199

CLASS 132

9 3,926,200
91 3,926,201

CLASS 134

6 3,926,663
18 3,926,665
21 3,926,664
25R 3,926,666
167R 3,926,667
179 3,926,668

CLASS 135

20M 3,926,202

CLASS 136

6LN 3,926,669
26 3,926,670
29 3,926,671
30 3,926,672
31 3,926,673
36 3,926,674
86E 3,926,675
86R 3,926,676
107 3,926,677
122 3,926,678
146 3,926,679
154 3,926,680
241 3,926,681

CLASS 137

13 3,926,203
116.5 3,926,204
223 3,926,205
281 3,926,206
3,926,207
484.8 3,926,208
487.5 3,926,209
491 3,926,210
494 3,926,211
495 3,926,212
504 3,926,213
525.3 3,926,214
527.8 3,926,215
3,926,216
596.18 3,926,217
625.27 3,926,218
625.49 3,926,219
636.1 3,926,220
819 3,926,221

CLASS 138

122 3,926,222
129 3,926,223

CLASS 139

122H 3,926,224
125 3,926,225
190 3,926,226
383R 3,926,227
420R 3,926,228

CLASS 141

1 3,926,229
45 3,926,230
192 3,926,231

CLASS 144

2N Re.28,651
136J 3,926,232

CLASS 148

1.5 3,926,682
11.5R 3,926,683
3,926,684
12EA 3,926,685
12B 3,926,687
12F 3,926,686
12.1 3,926,688
12.4 3,926,689
32 3,926,690
3,926,691
36 3,926,692
175 Re.28,653
3,926,693
187 3,926,694
3,926,695

CLASS 149

2 3,926,696
14 3,926,697
44 3,926,698

CLASS 150

2.5 3,926,233
40 3,926,234

CLASS 151

21C 3,926,235
34 3,926,237
41.73 3,926,236

CLASS 152

209 3,926,238
210 3,926,239
226 3,926,240
415 3,926,241

CLASS 156

3 3,926,699
86 3,926,701
89 3,926,702
124 3,926,703
126 3,926,704
155 3,926,705
212 Re.28,654
229 3,926,706
239 3,926,707
242 3,926,708
309 3,926,709
362 3,926,710
394 3,926,711
477B 3,926,712
510 3,926,713
516 3,926,714
612 3,926,715

CLASS 160

89 3,926,242
328 3,926,243

CLASS 162

113 3,926,716
157C 3,926,717
168 3,926,718
253 3,926,719

CLASS 164

4 3,926,244
53 3,926,245
56 3,926,246
263 3,926,247
273R 3,926,248

CLASS 165

3 3,926,249
48 3,926,250
165 3,926,251

CLASS 166

54.6 3,926,252
88 3,926,253
106 3,926,254
270 3,926,255
285 3,926,256
293 3,926,257
294 3,926,258
302 3,926,259
315 3,926,260

CLASS 172

688 3,926,261
780 3,926,262
801 3,926,263

CLASS 173

12 3,926,264
80 3,926,265
110 3,926,266

CLASS 174

19 3,927,246
36 3,927,247
41 3,927,248
51 3,927,249

CLASS 175

19 3,926,267
62 3,926,268
104 3,926,269

CLASS 176

18 3,926,720
19R 3,926,721
87 3,926,722

CLASS 177

210 3,926,271
251 3,926,270

CLASS 178

5.6 3,927,250
6 3,927,251
6.7R 3,927,252
6.8 3,927,253
3,927,258
7.1 3,927,254
7.3DC 3,927,255
7.6 3,927,256
60 3,927,257

CLASS 179

1GQ 3,927,262
1MN 3,927,259
3,927,260
1E 3,927,261
2DP 3,927,263
3,927,265
2A 3,927,264
2.5R 3,927,266
15AT 3,927,267
15BS 3,927,269
15BW 3,927,268
17A 3,927,270
18AB 3,927,271
18AD 3,927,272
18J 3,927,273
97 3,927,275
98 3,927,277
99 3,927,278
107FD 3,927,279
170G 3,927,280
175.3R 3,927,281
178 3,927,282

CLASS 180

1C 3,926,272
9.48 3,926,273
35 3,926,274
77R 3,926,275
89R 3,926,276
115 3,926,277

CLASS 182

7 3,926,278

CLASS 184

6.16 3,926,281
29 3,926,279
55A 3,926,280

CLASS 188

106F 3,926,282
196BA 3,926,284
196B 3,926,283
218XL 3,926,285

CLASS 192

41S 3,926,286
61 3,926,287
104F 3,926,288

CLASS 193

23 3,926,289
27 3,926,290

CLASS 194

4F 3,926,291

CLASS 195

1.8 3,926,723
28N 3,926,725
28R 3,926,724
30 3,926,726
36P 3,926,728
63 3,926,727
3,926,729
66R 3,926,730
80R 3,926,731
103.5R 3,926,732
3,926,734
3,926,735
3,926,736
103.5 3,926,733
108 3,926,737
127 3,926,738

CLASS 197

1R 3,926,292
3,926,293
19 3,927,274
36 3,926,294
55 3,926,295

CLASS 198

16R 3,926,296
19 3,926,297
20C 3,926,300
20R 3,926,298
3,926,299
53R 3,926,302
90 3,926,301
177R 3,926,303
208 3,926,304

CLASS 200

5R 3,927,283
3,927,284
6A 3,927,285
61.45R 3,927,286
61.47 3,927,287
277 3,927,288
284 3,927,289
314 3,927,290
327 3,927,276

CLASS 202

173 3,926,739
261 3,926,740
269 3,926,741

CLASS 203

3 3,926,742
10 3,926,743
55 3,926,744

CLASS 204

1T 3,926,745
15 3,926,746
3,926,747
43G 3,926,748
43S 3,926,749
99 3,926,750
105R 3,926,751
107 3,926,752
149 3,926,753
152 3,926,754
159.15 3,926,755
159.22 3,926,756
162HE 3,926,757
163R 3,926,758
180P 3,926,759
181 3,926,760
3,926,761
192 3,926,762
3,926,763
195F 3,926,764
3,926,765
195P 3,926,766
206 3,926,767
229 3,926,768
237 3,926,769
256 3,926,770
268 3,926,771
283 3,926,772
290F 3,926,773
308 3,926,774

CLASS 206

73 3,926,305
84 3,926,306
153 3,926,307
223 3,926,308
364 3,926,309
387 3,926,310
439 3,926,311
444 3,926,312
455 3,926,313

CLASS 208

10 3,926,775
32 3,926,776
57 3,926,777
65 3,926,779
74 3,926,778
111 3,926,780
117 3,926,781
135 3,926,782
157 3,926,783
210 3,926,784
211 3,926,785
264 3,926,786

CLASS 209

3 3,926,787
3,926,788
8 3,926,789
9 3,926,790
3,926,791
215 3,926,792
426 3,926,793

CLASS 210

5 3,926,794
11 3,926,795
3,926,796
22 3,926,797
23 3,926,798
3,926,799
31C 3,926,800
58 3,926,801
62 3,926,802
63 3,926,803
76 3,926,804
101 3,926,805
137 3,926,806
177 3,926,807
195 3,926,808
198C 3,926,809
220 3,926,810
231 3,926,811
242 3,926,812
321 3,926,813
323 3,926,814
424 3,926,815

CLASS 211

71 3,926,314
102 3,926,315

CLASS 212

59R 3,926,316

CLASS 213

20 3,926,317

CLASS 214

1H 3,926,318
6B 3,926,319
8.5C 3,926,320
10.5R 3,926,321
305 3,926,322
310 3,926,323

CLASS 215

1C 3,926,324
206 3,926,325
218 3,926,326
3,926,327
220 3,926,328
361 3,926,329

CLASS 219

67 3,927,292
69C 3,927,293
105.55R 3,927,291
107 3,927,294
125R 3,927,295
155 3,927,296
212 Re.28,656
243 3,927,297
245 3,927,298
365 3,927,299
381 3,927,300
523 3,927,301

CLASS 220

3.9 3,926,330
63R 3,926,331
226 3,926,332
320 3,926,333

CLASS 221

7 3,926,334
82 3,926,335
296 3,926,336

CLASS 222

1 3,926,337
56 3,926,338
83 3,926,339
83.5 3,926,340
95 3,926,341
129.1 3,926,342
145 3,926,343
3,926,344
3,926,345
160 3,926,346
185 3,926,347
189 3,926,348
402.22 3,926,349
475 3,926,350

CLASS 223

88 3,926,351

CLASS 226

79 3,926,352
95 3,926,353
108 3,926,354
114 3,926,355

CLASS 227

3,926,356

CLASS 228

110 3,926,357
111 3,926,358
170 3,926,359
180 3,926,360

CLASS 229

1.5B 3,926,361
2.5 3,926,363
23BT 3,926,362
55 3,926,364
72 3,926,365

CLASS 232

15 3,926,366

CLASS 235

61.11E 3,927,303
61.9R 3,927,302
150.21 3,927,304
3,927,305
150.22 3,927,306
151.3 3,927,307
3,927,308
151.31 3,927,309
153AC 3,927,310
159 3,927,311
181 3,926,367
189 3,927,312

CLASS 236

41 3,926,368

CLASS 239

1 3,926,369
3,926,374
25 3,926,370
146 3,926,371
177 3,926,372
265.17 3,926,373
542 3,926,375
583 3,926,376
655 3,926,377

CLASS 240

1.4 3,927,313
7.5 3,927,314
52.1 3,927,315

CLASS 241

69 3,926,379
154 3,926,378
248 3,926,380

CLASS 242

47.01 3,926,381
79 3,926,382
85.1 3,926,383
107.4 3,926,384
3,926,385
118 3,926,386
198 3,926,387

CLASS 244

3.22 3,926,390
17.11 3,926,388
45A 3,926,389
149 3,926,391

CLASS 248

117.1 3,926,392
165 3,926,393
217 3,926,394
223 3,926,395
418 3,926,396
430 3,926,397
448 3,926,398
467 3,926,399

CLASS 249

40 3,926,400
59 3,926,401
117 3,926,402
185 3,926,403
213 3,926,404

CLASS 250

199 3,927,316
214R 3,927,317
272 3,927,318
273 3,927,319
307 3,927,320
311 3,927,321
315 3,927,322
329 3,927,323
336 3,927,324
435 3,927,325
447 3,927,326
470 3,927,327
473 3,927,328

CLASS 251

129 3,926,405
144 3,926,406
315 3,926,407
327 3,926,408
344 3,926,409

CLASS 252

8.9 3,926,816
11 3,926,817
12.4 3,926,818
31 3,926,819
33 3,926,820
46.7 3,926,821
48.6 3,926,822
49.9 3,926,823
62.1 3,926,824
3,926,825
62.54 3,926,826
63.5 3,926,916
99 3,926,827
117 3,926,828
132 3,926,829
135 3,926,830
171 3,926,831
181.6 3,926,832
188 3,926,833
299 3,926,834
300 3,926,835
301.4F 3,926,838
301.4R 3,926,836
301.4S 3,926,837
355 3,926,839

356 3,926,840
383 3,926,841
411R 3,926,842
417 3,926,843
432 3,926,844
3,926,845
435 3,926,846
441 3,926,847
442 3,926,848
448 3,926,849
455R 3,926,850
3,926,851
456 3,926,852
3,926,853
462 3,926,854
465 3,926,855
466J Re.28,655
470 3,926,856
516 3,926,857
517 3,926,858
522 3,926,859
3,926,860
3,927,083
542 3,926,861
545 3,926,862
557 3,926,863

CLASS 254

1 3,926,410
89R 3,926,411

CLASS 256

46 3,926,412

CLASS 259

4R 3,926,413
108 3,926,414

CLASS 260

2H 3,926,950
2.1E 3,926,864
2.5AH 3,926,866
2.5AM 3,926,867
2.5AS 3,926,868
2.5N 3,926,865
8 3,926,869
3,926,870
17.4GC 3,926,872
18R 3,926,873
22A 3,926,874
23TN 3,926,875
23R 3,926,876
23.7A 3,926,877
27BB 3,926,880
27EV 3,926,878
27R 3,926,879
28.5AS 3,926,884
28.5AV 3,926,882
28.5A 3,926,883
28.5D 3,926,881
29.1SB 3,926,885
29.2EP 3,926,886
29.2N 3,926,887
29.4UA 3,926,888
29.6MP 3,926,894
29.6PM 3,926,889
29.6TA 3,926,892
29.6E 3,926,891
29.6H 3,926,890
29.6R 3,926,893
30.4R 3,926,895
31.2R 3,926,896
32.8R 3,926,897
33.4R 3,926,898
3,926,899
33.6AQ 3,926,900
3,926,901
40R 3,926,902
42.28 3,926,903
3,926,904
42.43 3,926,905
42.53 3,926,906
45.7P 3,926,907
45.7S 3,926,908
45.85A 3,926,913
45.85N 3,926,909
45.95R 3,926,910
46.5E 3,926,911
47CP 3,926,914
67.6R 3,926,917
73L 3,926,918
75NH 3,926,919
75R 3,926,920
77.5AM 3,926,922
78R 3,926,923
3,926,924
78.5R 3,926,925
80.72 3,926,871
85.3R 3,926,929
85.5B 3,926,926
85.5S 3,926,927
3,926,930
88.2 3,926,928
92.3 3,926,912
92.8W 3,926,931
93.7 3,926,932
94.3 3,926,933
94.9A 3,926,934
96.5R 3,926,935

97.5 3,926,936
112.5 3,926,937
3,926,938
122 3,926,939
123.5 3,926,940
146R 3,926,941
146T 3,926,942
152 3,926,943
153 3,926,944
205 3,926,945
206 3,926,946
209R 3,926,947
210AB 3,926,948
211.5R 3,926,949
231A 3,926,951
239BC 3,926,953
239.1 3,926,954
3,926,955
3,926,956
3,926,957
3,926,958
3,926,959
3,926,960
239.3D 3,926,952
239.57 3,926,962
239.7 3,926,961
240CA 3,926,963
3,926,964
240A 3,926,966
3,926,967
240R 3,926,965
3,926,968
240.1 3,926,969
240.4 3,926,970
240.6 3,926,971
243B 3,926,975
243C 3,926,972
3,926,973
3,926,974
3,926,978
3,926,979
3,926,980
3,926,983
3,926,984
3,926,985
243D 3,926,977
243R 3,926,976
3,926,981
3,926,982
244 3,926,986
246R 3,926,987
247.5EP 3,926,988
247.7C 3,926,989
249.6 3,926,990
250QN 3,926,992
250Q 3,926,991
251QB 3,926,993
251R 3,926,994
256 3,926,995
256.4Q 3,926,996
256.5R 3,926,997
3,926,998
268PH 3,926,999
283R 3,927,000
293.86 3,927,001
294.8B 3,927,005
294.8F 3,927,002
294.8G 3,927,003
3,927,006
294.8K 3,927,004
294.9 3,927,007
295.5R 3,927,008
296D 3,927,009
296R 3,927,010
3,927,011
304 3,927,012
306.7C 3,927,013
306.7T 3,927,014
308R 3,927,015
309 3,927,016
3,927,017
3,927,018
309.2 3,927,020
309.5 3,927,021
309.6 3,927,019
3,927,022
3,927,023
309.7 3,927,024
310D 3,927,025
314.5 3,927,026
326S 3,927,027
327S 3,927,028
335 3,927,029
340.3 3,927,030
340.9 3,927,031
3,927,032
343.2R 3,927,033
343.5 3,927,034
343.9 3,927,035
345.3 3,927,036
346.2R 3,927,037
346.3 3,927,038
3,927,039
346.4 3,927,040
346.8 3,927,041
348SC 3,927,042

381 3,927,043
394 3,927,044
396R 3,927,045
397.3 3,927,046
404 3,927,047
3,927,048
3,927,049
3,927,050
413 3,927,051
429.7 3,927,052
433 3,927,053
438.1 3,927,054
3,927,055
439R 3,927,056
448.2E 3,927,057
3,927,058
3,927,059
3,927,060
456NS 3,927,062
458 3,927,061
465D 3,927,063
3,927,066
465E 3,927,064
3,927,065
465.6 3,927,067
468H 3,927,068
470 3,927,069
479C 3,927,070
479R 3,927,071
484R 3,927,072
485G 3,927,073
487 3,927,074
488R 3,927,075
3,927,076
3,927,077
494 3,927,078
501.1 3,927,079
502.5 3,927,080
505P 3,927,081
519 3,927,082
523A 3,927,084
526S 3,927,085
530N 3,926,915
552R 3,927,086
3,927,087
553DA 3,927,088
553R 3,927,089
556A 3,927,090
559AT 3,927,094
559B 3,927,092
559T 3,927,091
564E 3,927,097
564F 3,927,096
566R 3,927,095
571 3,927,093
575 3,927,098
576 3,927,099
578 3,927,100
580 3,927,101
583N 3,927,102
584B 3,927,104
584C 3,927,103
586P 3,927,105
3,927,108
586R 3,927,106
3,927,107
598 3,927,109
599 3,927,110
604AC 3,927,111
606.5P 3,927,112
3,927,113
610A 3,927,114
610B 3,927,115
611F 3,927,116
613A 3,927,119
613D 3,927,117
3,927,118
618H 3,927,120
3,927,121
621A 3,927,124
621G 3,927,122
3,927,123
623H 3,927,125
633 3,927,126
646 3,927,127
649R 3,927,128
653.1R 3,927,129
654D 3,927,131
654R 3,927,130
658R 3,927,132
669QZ 3,927,133
671P 3,927,134
672R 3,927,135
3,927,136
680B 3,927,137
680E 3,927,138
829 3,927,139
838 3,927,140
849 3,927,141
878R 3,927,142
886 3,927,143
888 3,927,144
897B 3,927,145
921 3,927,146
927N 3,927,147
937 3,927,150

948 3,927,148
951 3,927,149
975 3,927,151

CLASS 261

122 3,927,152
128 3,927,153

CLASS 264

.5 3,927,154
6 3,927,155
15 3,927,156
29 3,927,157
36 3,927,158
45.3 3,927,159
45.5 3,927,160
46.6 3,927,161
51 3,927,162
71 3,927,163
95 3,927,164
129 3,927,165
144 3,927,166
210F 3,927,167

CLASS 266

5E 3,926,415
33R 3,926,416
41 3,926,417

CLASS 269

13 3,926,418
16 3,926,419
47 3,926,420
57 3,926,421
60 3,926,422

CLASS 270

55 3,926,423
62 3,926,424
83 3,926,425

CLASS 271

3 3,926,426
9 3,926,427
109 3,926,428
174 3,926,429

CLASS 272

79C 3,926,430

CLASS 273

73D 3,926,431
85D 3,926,432
85F 3,926,433
86B 3,926,434
86C 3,926,435
131B 3,926,437
134C 3,926,438
136A 3,926,439

CLASS 274

14 3,926,440
37 3,926,441

CLASS 277

3 3,926,442
96 3,926,443
177 3,926,444
204 3,926,445

CLASS 279

4 3,926,446
57 3,926,447

CLASS 280

1.5 3,926,448
11.23 3,926,449
11.35B 3,926,450
11.35C 3,926,451
79.2 3,926,452
81R 3,926,453
124A 3,926,454
150SB 3,926,455
515 3,926,456

CLASS 285

39 3,926,457
177 3,926,458
381 3,926,459

CLASS 290

1 3,927,329
54 3,927,330

CLASS 292

144 3,926,460
275 3,926,461

CLASS 293

63 3,926,462
3,926,463

CLASS 294

19A 3,926,464
3,926,465
64R 3,926,466
83R 3,926,467
102R 3,926,468

CLASS 296

15 Re.28,652
23R 3,926,469
97B 3,926,470
137R 3,926,471

CLASS 297

88 3,926,472
115 3,926,473
355 3,926,474

CLASS 300

21 3,926,475

CLASS 303

6C 3,926,476
21AF 3,926,479
21F 3,926,480
21P 3,926,477
21R 3,926,478

CLASS 307

232 3,927,331
252C 3,927,332
255 3,927,333
269 3,927,334
296 3,927,335
308 3,927,336

CLASS 308

6R 3,926,481
9 3,926,482
174 3,926,484
193 3,926,485

CLASS 310

11 3,927,337
68D 3,927,338
155 3,927,339

CLASS 312

107 3,926,483
198 3,926,486
223 3,926,487
241 3,926,488
250 3,926,489
319 3,926,490
330R 3,926,491
348 3,926,492

CLASS 313

188 3,927,342
214 3,927,343
371 3,927,340
412 3,927,341
499 3,927,344

CLASS 315

30 3,927,346
39.55 3,927,347
88 3,927,348
205 3,927,349
412.005 3,927,345

CLASS 317

11C 3,927,350
27R 3,927,351
3,927,352
40A 3,927,353
81 3,927,354
100 3,927,355
123 3,927,356

CLASS 318

139 3,927,357
224 3,927,358
434 3,927,359
619 3,927,360

CLASS 320

39 3,927,361

CLASS 321

5 3,927,362
11 3,927,363
15 3,927,364

CLASS 323

48 3,927,365

CLASS 324

29.5 3,927,366
3,927,367
57R 3,927,368
58.5C 3,927,369
65R 3,927,370
73R 3,927,371

CLASS 325

38B 3,927,372
58 3,927,373
363 3,927,375
478 3,927,376

CLASS 328

151 3,927,374
167 3,927,377

CLASS 329

145 3,927,378

CLASS 330

10 3,927,379
21 3,927,380
29 3,927,381
3,927,382
59 3,927,383

CLASS 331

2 3,927,384
94.5H 3,927,385

CLASS 335

284 3,927,386

CLASS 338

317 3,927,387

CLASS 339

12R 3,926,493
34 3,926,494

48 3,926,495
65 3,926,496
91R 3,926,497
97R 3,926,498
136R 3,926,499

CLASS 340

6R 3,927,388
38R 3,927,389
60 3,927,390
146.1BE 3,927,392
146.2 3,927,391
149A 3,927,393
172.5 3,927,394
3,927,395
173R 3,927,396
174TF 3,927,397
3,927,398
248D 3,927,399
276 3,927,400
347DD 3,927,401
366B 3,927,402
396 3,927,403
413 3,927,404

CLASS 343

5CM 3,927,405
16M 3,927,406
754 3,927,407
779 3,927,408

CLASS 346

74ES 3,927,409
140 3,927,410

CLASS 350

17 3,926,500
96B 3,926,501
160LC 3,926,502
189 3,926,504
201 3,926,505
214 3,926,506
215 3,926,503
216 3,926,507
218 3,925,910
296 3,926,508
301 3,926,509
310 3,926,510

CLASS 352

5 3,926,511
25 3,926,512

CLASS 353

26 3,926,513
113 3,926,514

CLASS 354

4 3,927,411
143 3,927,412
173 3,927,413
195 3,927,414
230 3,927,415
235 3,927,416
298 3,927,417

CLASS 355

3DD 3,926,516
3,926,517
3R 3,926,515
8 3,926,518
14 3,926,519
80 3,926,520

CLASS 356

39 3,926,521
51 3,926,522
110 3,926,523
114 3,926,524
205 3,926,525
246 3,926,526
3,926,527

CLASS 357

24 3,927,418

CLASS 360

65 3,927,420
94 3,927,419

CLASS 401

274 3,926,528

CLASS 403

4 3,926,529
167 3,926,530
293 3,926,531
322 3,926,532

CLASS 404

26 3,926,533

CLASS 415

89 3,926,534
203 3,926,535

CLASS 416

135 3,926,536

CLASS 417

353 3,926,537

CLASS 418

115 3,926,538
149 3,926,539
197 3,926,540

CLASS 423

22 3,927,168

24	3,927,169	443	3,927,185		3,927,199	234	3,927,213		CLASS 427	302	3,927,235
33	3,927,170	447	3,927,186	50	3,927,200	251	3,927,214	34	3,927,223	304	3,927,236
118	3,927,171	448	3,927,187	54	3,927,201		3,927,215	64	3,927,224	325	3,927,237
129	3,927,172	463	3,927,188	57	3,927,202	269	3,927,216	84	3,927,225	336	3,927,238
142	3,927,173	513	3,927,189	61	3,927,203	274	3,927,217	140	3,927,226	355	3,927,239
155	3,927,174	515	3,927,190	78	3,927,204	285	3,927,218	162	3,927,227	403	3,927,240
206	3,927,175	570	3,927,191	80	3,927,205	300	3,927,219		3,927,228	408	3,927,241
210	3,927,176	648	3,927,192	81	3,927,206	321	3,927,220	171	3,927,229	411	3,927,242
235	3,927,177		CLASS 424	84	3,927,207		CLASS 425	282	3,927,230	433	3,927,243
242	3,927,178			89	3,927,208	64	3,926,541	390	3,927,231	483	3,927,244
300	3,927,179	1	3,927,193		3,927,209	174.4	3,926,542	401	3,927,232	513	3,927,245
308	3,927,180	15	3,927,194	118	3,927,210		CLASS 426		CLASS 428		CLASS 431
345	3,927,181	21	3,927,195	122	3,927,211	576	3,927,221	58	3,927,233	9	3,926,543
392	3,927,182	37	3,927,196	177	3,926,921	621	3,927,222	95	3,926,700	114	3,926,544
393	3,927,183	45	3,927,197		3,927,212			273	3,927,234	122	3,926,545
394	3,927,184	47	3,927,198								

CLASSIFICATION OF DESIGNS

D2—	276	238,016	179	238,028	D9 —156	238,050	M	238,066	42	238,084	238,100
	310	238,017	186	238,029	240	238,051	D19— 45	238,068	D30— 13	238,085	D64— 10	238,101
	351	238,018	197	238,030	259	238,052	D23— 15	238,069	D34— 5GB	238,086	12B	238,102
D6—	22	238,019		238,031	D10— 7	238,053	55	238,071	GH	238,087	D77— 1R	238,103
	27	238,020	199	238,038	24	238,054		238,072	D35— 3A	238,088	D83— G	238,106
	41	238,021	251	238,032	38	238,055		238,074	D45— 17	238,089	P	238,105
	49	238,022	D7— 23	238,039	69	238,056	58	238,070		238,090	S	238,104
	62	238,023	107	238,040	106	238,057		238,073	19V	238,091	12A	238,107
	63	238,024	173	238,041	D12— 34	238,058	59	238,075	D47— 6E	238,092	R	238,108
	71	238,033	D8— 9	238,042	62	238,059	141	238,076		238,093	D86— 10F	238,109
	74	238,034	22	238,043	146	238,060	D26— 1R	238,077	D48— 31	238,094	D87— 1D	238,110
	96	238,025	31	238,044	148	238,061	5C	238,078		238,095		238,111
	99	238,035		238,045	155	238,062		238,080		238,096	R	238,112
	137	238,036	68	238,046	209	238,063	13R	238,082	32R	238,097		238,113
	144	238,026	147	238,047	210	238,064	14A	238,079	D56— 4B	238,098	D94— 3B	238,114
		238,027	181	238,048	D13— 1J	238,065	B	238,081	D57— 1E	238,099		238,115
	147	238,037	242	238,049		238,067	D27— 7	238,083				

CLASSIFICATION OF PLANTS

P. —	36	3,815	P. —	51	3,817	P. — 70	3,816	

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

3,926,164	3,926,140	3,926,906	3,926,372	3,926,131	3,926,316
3,926,241	3,926,143	3,926,913	3,926,391	3,926,146	3,926,323
3,926,389	3,926,159	3,926,947	3,926,443	3,926,167	3,926,324
1 : 3,925,871	3,926,160	3,927,003	3,926,881	3,926,183	3,926,335
3,926,927	3,926,168	3,927,019	3,927,152	3,926,340	3,926,337
3,927,178	3,926,175	3,927,027	3,927,169	3,926,386	3,926,339
3,927,312	3,926,176	3,927,028	3,927,299	3,926,424	3,926,350
3,927,337	3,926,192	3,927,033	3,927,402	3,926,448	3,926,352
2 : 3,925,854	3,926,199	3,927,061	9 : 3,926,110	3,926,597	3,926,366
4 : 3,925,856	3,926,203	3,927,062	3,926,129	3,926,814	3,926,368
3,925,896	3,926,213	3,927,078	3,926,349	3,926,887	3,926,376
3,926,393	3,926,229	3,927,086	3,926,388	3,926,893	3,926,402
3,926,520	3,926,230	3,927,157	3,926,413	3,927,182	3,926,416
3,926,663	3,926,231	3,927,163	3,926,425	3,927,265	3,926,430
3,926,667	3,926,232	3,927,166	3,926,473	3,927,287	3,926,438
3,927,306	3,926,237	3,927,184	3,926,582	3,927,317	3,926,461
5 : 3,927,236	3,926,275	3,927,216	3,926,703	13 : 3,925,956	3,926,483
6 : Re.28,651	3,926,287	3,927,219	3,926,722	3,926,371	3,926,490
3,925,821	3,926,295	3,927,220	3,926,806	3,926,547	3,926,492
3,925,827	3,926,322	3,927,230	3,926,903	3,926,657	3,926,496
3,925,828	3,926,361	3,927,233	3,926,904	3,927,140	3,926,498
3,925,833	3,926,362	3,927,237	3,926,991	16 : 3,926,390	3,926,499
3,925,835	3,926,367	3,927,242	3,926,992	17 : Re.28,656	3,926,504
3,925,842	3,926,374	3,927,254	3,927,002	3,925,836	3,926,514
3,925,869	3,926,375	3,927,258	3,927,067	3,925,901	3,926,558
3,925,875	3,926,380	3,927,266	3,927,074	3,925,906	3,926,570
3,925,879	3,926,392	3,927,282	3,927,146	3,925,924	3,926,623
3,925,880	3,926,400	3,927,298	3,927,215	3,925,946	3,926,644
3,925,890	3,926,444	3,927,311	3,927,222	3,925,952	3,926,705
3,925,899	3,926,465	3,927,315	3,927,395	3,925,954	3,926,740
3,925,908	3,926,491	3,927,318	10 : 3,925,898	3,925,989	3,926,792
3,925,923	3,926,505	3,927,319	3,925,976	3,926,026	3,926,805
3,925,935	3,926,527	3,927,321	3,925,996	3,926,028	3,926,818
3,925,939	3,926,534	3,927,322	3,926,240	3,926,030	3,926,849
3,925,940	3,926,537	3,927,334	3,926,614	3,926,062	3,926,855
3,925,941	3,926,541	3,927,352	3,926,642	3,926,071	3,926,868
3,925,949	3,926,567	3,927,362	3,926,643	3,926,076	3,926,879
3,925,951	3,926,575	3,927,388	3,926,756	3,926,081	3,926,882
3,925,983	3,926,694	3,927,401	3,926,760	3,926,084	3,926,900
3,926,021	3,926,708	3,927,409	3,926,826	3,926,105	3,926,928
3,926,040	3,926,735	3,927,411	3,926,897	3,926,113	3,926,938
3,926,044	3,926,745	8 : 3,925,839	3,926,907	3,926,149	3,926,962
3,926,046	3,926,780	3,925,844	3,926,916	3,926,166	3,927,036
3,926,055	3,926,785	3,925,870	3,927,056	3,926,189	3,927,041
3,926,059	3,926,800	3,925,945	3,927,065	3,926,190	3,927,076
3,926,065	3,926,802	3,925,982	3,927,069	3,926,191	3,927,100
3,926,087	3,926,815	3,926,035	3,927,189	3,926,193	3,927,106
3,926,090	3,926,834	3,926,061	11 : 3,926,399	3,926,264	3,927,139
3,926,122	3,926,845	3,926,209	12 : 3,925,822	3,926,288	3,927,174
3,926,137	3,926,854	3,926,238	3,925,929	3,926,307	3,927,235
3,926,139	3,926,884	3,926,319	3,925,973	3,926,311	3,927,249

3,927,252
3,927,264
3,927,280
3,927,290
3,927,316
3,927,359
3,927,399
3,927,400
18 : Rc.28,650
3,925,852
3,925,888
3,925,980
3,926,008
3,926,032
3,926,043
3,926,052
3,926,067
3,926,092
3,926,108
3,926,162
3,926,171
3,926,174
3,926,184
3,926,245
3,926,330
3,926,342
3,926,379
3,926,458
3,926,463
3,926,466
3,926,521
3,926,594
3,926,777
3,926,902
3,926,908
3,926,978
3,927,020
3,927,212
3,927,247
3,927,276
3,927,288
3,927,289
19 : 3,926,004
3,926,011
3,926,206
3,926,207
3,926,263
3,927,363
20 : 3,925,970
3,925,971
3,926,156
3,926,847
3,926,895
3,926,949
21 : 3,926,001
3,926,358
3,926,486
22 : 3,925,848
3,925,953
3,925,984
3,925,991
3,925,998
3,926,003
3,926,006
3,926,489
3,926,549
3,926,550
3,926,555
3,926,580
3,926,581
3,926,709
3,926,901
23 : 3,926,351
24 : 3,925,900
3,926,050
3,926,075
3,926,120
3,926,121
3,926,178
3,926,221
3,926,246
3,926,385
3,926,475
3,926,522
3,926,562
3,926,684
3,926,755
3,926,775
3,926,787
3,926,851
3,926,892
3,927,147
3,927,268
3,927,310
3,927,323
3,927,324
3,927,391
3,927,408
25 : 3,925,823
3,925,825
3,925,883
3,925,960
3,925,979
3,925,985
3,926,020
3,926,037

3,926,054
3,926,196
3,926,197
3,926,369
3,926,382
3,926,433
3,926,451
3,926,571
3,926,573
3,926,601
3,926,669
3,926,672
3,926,679
3,926,700
3,926,714
3,926,723
3,926,765
3,926,812
3,926,864
3,926,889
3,926,922
3,926,971
3,927,010
3,927,221
3,927,291
3,927,347
3,927,367
3,927,385
3,927,404
3,927,412
3,927,415
26 : 3,925,920
3,925,931
3,925,932
3,925,942
3,926,045
3,926,066
3,926,094
3,926,141
3,926,153
3,926,158
3,926,208
3,926,236
3,926,279
3,926,280
3,926,281
3,926,303
3,926,359
3,926,360
3,926,418
3,926,431
3,926,462
3,926,467
3,926,469
3,926,470
3,926,471
3,926,485
3,926,510
3,926,540
3,926,559
3,926,569
3,926,656
3,926,666
3,926,749
3,926,769
3,926,772
3,926,803
3,926,874
3,926,885
3,926,888
3,926,932
3,927,004
3,927,016
3,927,053
3,927,075
3,927,090
3,927,161
3,927,186
3,927,285
3,927,305
3,927,314
3,927,348
3,927,355
27 : 3,925,834
3,925,885
3,926,104
3,926,200
3,926,234
3,926,286
3,926,305
3,926,312
3,926,365
3,926,456
3,926,798
3,927,037
3,927,103
3,927,239
3,927,275
3,927,366
3,927,393
28 : 3,925,849
3,926,000
3,926,136
3,926,652
3,926,801
29 : 3,925,887

3,926,098
3,926,147
3,926,173
3,926,370
3,926,460
3,926,577
3,926,613
3,926,758
3,927,080
3,927,172
30 : 3,925,919
31 : 3,925,874
3,925,974
3,926,273
3,926,378
3,926,383
32 : 3,926,420
33 : 3,926,107
3,926,292
3,926,544
34 : Rc.28,653
3,925,867
3,925,895
3,925,909
3,926,031
3,926,096
3,926,097
3,926,133
3,926,169
3,926,185
3,926,187
3,926,201
3,926,228
3,926,333
3,926,355
3,926,405
3,926,423
3,926,434
3,926,513
3,926,553
3,926,579
3,926,616
3,926,637
3,926,638
3,926,639
3,926,640
3,926,641
3,926,681
3,926,693
3,926,695
3,926,710
3,926,778
3,926,782
3,926,783
3,926,795
3,926,819
3,926,828
3,926,835
3,926,837
3,926,843
3,926,860
3,926,861
3,926,862
3,926,870
3,926,883
3,926,886
3,926,920
3,926,925
3,926,935
3,926,965
3,926,967
3,926,968
3,926,977
3,926,982
3,926,988
3,927,014
3,927,018
3,927,022
3,927,023
3,927,031
3,927,073
3,927,079
3,927,083
3,927,093
3,927,096
3,927,109
3,927,115
3,927,143
3,927,148
3,927,155
3,927,171
3,927,185
3,927,188
3,927,193
3,927,199
3,927,210
3,927,218
3,927,238
3,927,251
3,927,255
3,927,257
3,927,308
3,927,332
3,927,336
3,927,379
3,927,384

3,927,386
3,927,392
3,927,398
35 : 3,926,063
3,926,276
3,926,808
3,926,953
36 : 3,925,830
3,925,832
3,925,841
3,925,876
3,925,886
3,925,889
3,925,894
3,925,915
3,925,925
3,925,948
3,925,959
3,925,990
3,926,058
3,926,082
3,926,085
3,926,086
3,926,088
3,926,109
3,926,124
3,926,126
3,926,134
3,926,135
3,926,144
3,926,161
3,926,194
3,926,235
3,926,265
3,926,271
3,926,294
3,926,308
3,926,331
3,926,338
3,926,343
3,926,347
3,926,348
3,926,394
3,926,404
3,926,435
3,926,437
3,926,439
3,926,487
3,926,494
3,926,516
3,926,519
3,926,556
3,926,564
3,926,568
3,926,574
3,926,578
3,926,587
3,926,593
3,926,602
3,926,626
3,926,629
3,926,645
3,926,648
3,926,655
3,926,670
3,926,713
3,926,736
3,926,753
3,926,754
3,926,762
3,926,763
3,926,766
3,926,768
3,926,779
3,926,794
3,926,824
3,926,838
3,926,839
3,926,842
3,926,945
3,926,970
3,926,975
3,927,000
3,927,008
3,927,026
3,927,048
3,927,049
3,927,050
3,927,055
3,927,077
3,927,102
3,927,104
3,927,117
3,927,135
3,927,136
3,927,154
3,927,175
3,927,179
3,927,225
3,927,261
3,927,270
3,927,273
3,927,281
3,927,371
3,927,380
3,927,406

3,927,410
37 : 3,925,850
3,925,905
3,925,986
3,926,204
3,926,248
3,926,464
3,926,747
3,926,816
3,926,833
3,926,923
3,927,052
3,927,167
3,927,293
38 : 3,926,411
39 : 3,925,921
3,925,955
3,925,968
3,925,988
3,926,007
3,926,029
3,926,034
3,926,080
3,926,112
3,926,222
3,926,239
3,926,243
3,926,251
3,926,283
3,926,296
3,926,298
3,926,302
3,926,315
3,926,318
3,926,320
3,926,321
3,926,373
3,926,401
3,926,415
3,926,421
3,926,422
3,926,447
3,926,476
3,926,478
3,926,482
3,926,530
3,926,566
3,926,572
3,926,600
3,926,607
3,926,617
3,926,653
3,926,711
3,926,716
3,926,719
3,926,734
3,926,770
3,926,771
3,926,821
3,926,822
3,926,871
3,926,894
3,926,898
3,926,910
3,926,919
3,926,926
3,926,950
3,927,099
3,927,111
3,927,137
3,927,162
3,927,173
3,927,224
3,927,263
3,927,329
3,927,342
40 : 3,925,829
3,925,862
3,926,145
3,926,170
3,926,254
3,926,258
3,926,363
3,926,610
3,926,742
3,926,823
3,926,933
3,927,058
3,927,059
3,927,060
3,927,138
3,927,397
41 : 3,925,893
3,926,181
3,926,188
3,926,328
3,926,398
3,926,453
3,926,526
42 : 3,925,858
3,925,868
3,925,917
3,925,947
3,926,019
3,926,027
3,926,103

3,926,150
3,926,172
3,926,198
3,926,212
3,926,278
3,926,297
3,926,325
3,926,357
3,926,452
3,926,488
3,926,497
3,926,592
3,926,604
3,926,605
3,926,624
3,926,633
3,926,692
3,926,718
3,926,737
3,926,738
3,926,748
3,926,759
3,926,767
3,926,784
3,926,804
3,926,820
3,926,872
3,926,937
3,926,952
3,926,974
3,926,984
3,927,021
3,927,072
3,927,081
3,927,092
3,927,120
3,927,121
3,927,127
3,927,153
3,927,168
3,927,180
3,927,194
3,927,196
3,927,232
3,927,240
3,927,246
3,927,341
3,927,345
3,927,350
3,927,360
3,927,376
44 : 3,926,381
3,926,909
45 : 3,925,864
3,925,865
3,926,334
3,927,044
46 : 3,926,532
47 : 3,925,831
3,925,845
3,926,344
3,926,560
3,926,704
3,926,746
3,926,799
3,927,192
3,927,271
48 : 3,925,872
3,925,963
3,926,009
3,926,010
3,926,036
3,926,041
3,926,047
3,926,057
3,926,119
3,926,165
3,926,177
3,926,249
3,926,253
3,926,255
3,926,256
3,926,259
3,926,260
3,926,269
3,926,272
3,926,309
3,926,409
3,926,428
3,926,432
3,926,457
3,926,472
3,926,529
3,926,588
3,926,774
3,926,781
3,926,786
3,926,788
3,926,809
3,926,848
3,926,867
3,926,891
3,926,934
3,926,940
3,927,035
3,927,110

	3,927,124		3,927,349		3,926,561		3,926,268	54 :	3,927,116		3,926,396
	3,927,131	49 :	3,925,938		3,926,743		3,926,336		3,927,260		3,926,419
	3,927,132		3,926,377		3,926,789		3,926,479	55 :	3,925,873		3,926,427
	3,927,160		3,926,698		3,927,259		3,926,596		3,925,944		3,926,445
	3,927,176		3,927,272		3,927,357		3,927,118		3,926,083		3,926,699
	3,927,227	51 :	3,925,891	53 :	3,925,918		3,927,325		3,926,116		3,927,292
	3,927,245		3,925,904		3,925,965		3,927,369		3,926,179		3,927,403
	3,927,307		3,926,012		3,926,018		3,927,370		3,926,299	56 :	Re.28,649
	3,927,330		3,926,186		3,926,262						

Design Patents

6 :	238,020	8 :	238,016		238,046		238,112	36 :	238,021		238,078
	238,028		238,057		238,051	26 :	238,029		238,022		238,097
	238,037	9 :	238,062		238,063		238,040		238,049	42 :	238,058
	238,043		238,089		238,086		238,053		238,069		238,067
	238,045		238,090		238,113		238,077		238,098		238,080
	238,056		238,102	18 :	238,038		238,085		238,099	47 :	238,107
	238,064		238,105	19 :	238,075	27 :	238,041		238,100	48 :	238,087
	238,070		238,114	20 :	238,091	29 :	238,018		238,109		238,094
	238,071	12 :	238,026		238,104	34 :	238,034	37 :	238,019		238,095
	238,072		238,027	21 :	238,076		238,065	39 :	238,050		238,096
	238,073		238,052	22 :	238,103		238,082		238,101		238,108
	238,074	13 :	238,081	24 :	238,032		238,110		238,115	55 :	238,024
	238,083	17 :	238,030	25 :	238,017		238,111	40 :	238,059		238,035
	238,106		238,031		238,036						

Plant Patents

34	3,815	3,817				

U. S. GOVERNMENT PRINTING OFFICE : O 1975

U.S. DEPARTMENT OF COMMERCE
Rogers C. B. Morton, *Secretary*

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*